

Home Computing WEEKLY

An Argus Specialist Publication

Britain's brightest weekly, packed with reviews and listings

No. 58
April 17-23, 1984

40p

WIN

200 prizes of Outback, a new game from Paramount must be won

Software reviews for: Spectrum, BBC Dragon, Sord M5 and Texas

Easter Special: great games for BBC and Electron to type in

Three fun listings for the Spectrum

PLUS: programs to type in for the Commodore 64, Oric and Dragon

AND U.S. Scene, your letters, software charts for SIX computers...

Amstrad's new micro: We bring you the facts



Computers or games players?

Parents buy computers to give their children a head start in life — but most of them end up as games playing machines.

This is the sobering conclusion in a report based on a survey of more than 2,000 people about their knowledge of, and attitudes to, home computers.

It predicts that another one million home computers will be sold between now and November.

The study was drawn up by Marketing Direction, in conjunction with Gallup. Graham Tillotson, managing director of Marketing Direction, said: "We have found time and time again that

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Black box hits pirates

Buyers of a new Dragon game will also find inside a black box about the size of a matchbox. It is a "software key", designed to halt piracy.

It is a test exercise by Microdeal, the Cornwall-based software house, and the game, Buzzard Bait, is due in the shops in 10 days, along with another 40 Microdeal titles.

Managing director John Symes said the box, containing unmarked chips, plugged into the Dragon's joystick port and de-encrypted the game.

He said: "It will cut out 99.9 per cent of piracy."

Buzzard Bait's author, Steve Back, was sent an encrypted copy and asked to decode it. Mr Symes said: "He spent three days on it and then told us: 'Forget it.'"

Mr Symes said Northern Software Consultants had been working on the key since August and the design costs ran into five figures.

Microdeal's games usually cost about £8, but Buzzard Bait will be priced at £9.95. Even then, said Mr Symes, Microdeal was losing money compared with its other products.

He said: "The industry will die without something like this. Only the other day we had a

Continued on page 6

FROM DER LIDDLE WABBITS...
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Software houses: send your new releases for review to the editor at the address below. Contact the editor for competitions and promotions, too.

HOME COMPUTING
WEEKLY
BRITAIN'S BRIGHTEST



Type in our Easter Special
for the BBC micro and
have some fun. It starts on
page 8.

PROGRAMS

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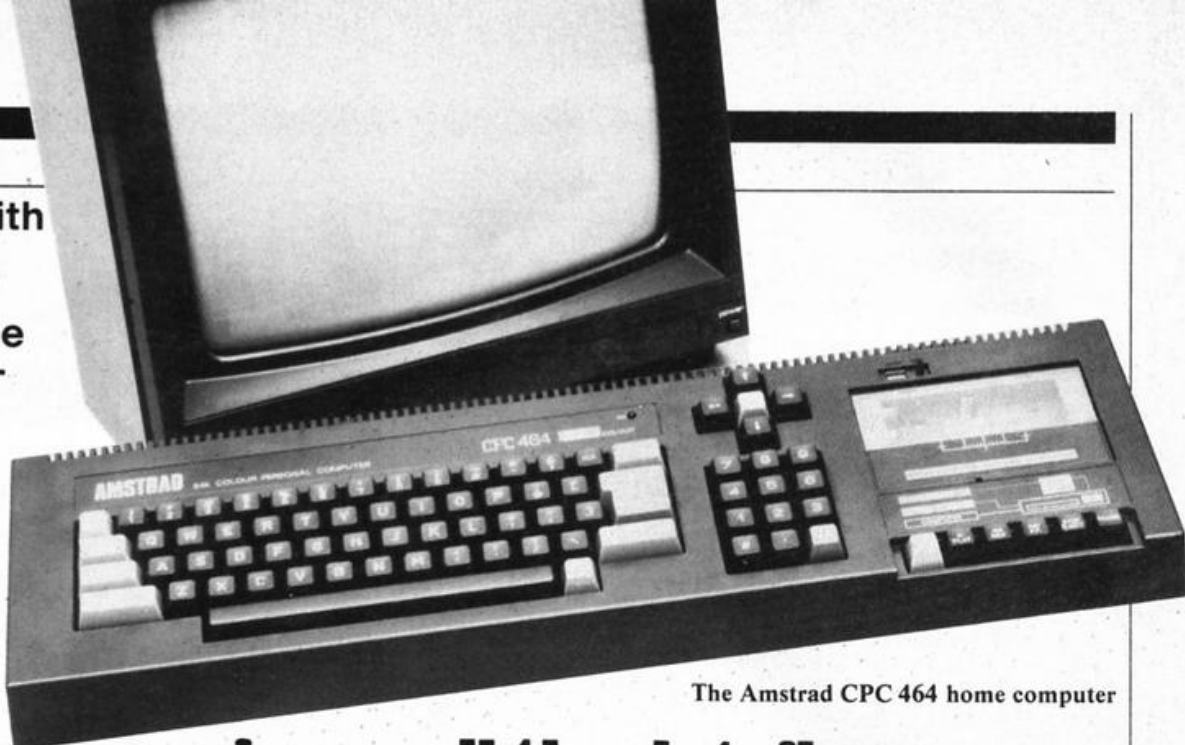
Code _____

Send to:
Ultimate Play The Game,
The Green,
Ashby de la Zouch,
Leicestershire.



After success with hi-fi equipment, Amstrad has launched a range of competitively-priced home computers.

Paul Liptrot brings you the first full report



The Amstrad CPC 464 home computer

Amstrad's new micros: all the details

Four chain stores have agreed to take 200,000 of Amstrad's new all-in-one home computer — the whole production for this year — and they will be on sale in eight weeks.

Amstrad, best known for hi-fi, developed the four-model range in just 11 months, said chairman Alan Sugar, who made the decision after visiting a U.S. consumer electronics show.

All the new computers have a green screen or colour monitor, 64K of RAM, 32K of ROM, a Z80A processor running at 4MHz, 74 type-writer-style keys — including numeric keypad — and built-in cassette player or 3in Hitachi-style disc drive.

Price details:

System 1 with built-in cassette player and green monitor **£229**

System 2 with built-in cassette player and colour monitor **£329**

System 3 with disc drive and green monitor **£429**

System 4 with disc drive and colour monitor **£529**

Mr Sugar said the first 5,000 of the cassette player models would be delivered to Rumbelows, Comet, Dixons and Boots in the first week of June and production would rise to 50,000 a month, totalling 600,000 next year.

Fifty software packages would be available at launch, branded with the Amsoft name and written by both in-house programmers and well-known UK software houses.

Mr Sugar, whose company's name comes from Alan Michael Sugar Trading, said the concept of the CPC 464 range was similar to Amstrad's tower hi-fi systems which eliminated separate units with spaghetti-like wiring at the back. Now computer users would not have to find a compatible cassette recorder or use the family TV.

Amstrad faced a crisis earlier, said Mr Sugar, when there was a staff problem and a new team was recruited from Ambit International and Locomotive Software. At that stage the casing had been designed, but pen was first put to paper on the electronics in August 1983.

He said: "It is quite heart-warming that this is still possible in the UK."

The launch, held in the Great Hall of Westminster School, featured men

Amstrad CPC 464 BASIC keywords

ABS	GOSUB	RELEASE sound
AFTER invoke subroutine after given time	HIMEM	REM
ASC	IF	REMAIN disables specified delay timer
ATN	INK	RENUM
AUTO line numbering	INKEY	RESTORE
BINS	INKEYS	RESUME
BORDER	INP returns value from I/O port	RETURN
CALL subroutine	INPUT	RND
CAT read and display file names	INSTR	ROUND a numeric expression
CHAIN	JOYSTICK read	RUN
CHAIN MERGE	KEY	SAVE
CHRS	KEY DEFine	SGN
CINT converts value to rounded integer in range - 32768 ... 32767	LEFTS	SIN
CLEAR	LEN	SOUND
CLG clear graphics	LET	SPACES to given length
CLOSEIN close cassette input file	LINE INPUT	SPEED INK for alternate colours
CLOSEOUT	LIST	SPEED KEY alter auto repeat rate
CLS	LOAD	SPEED WRITE select baud rate
CONTINUE	LOCATE	SQ check sound channel
COS	LOG	SQR
CREAL converts value to a real number	LOGIO	STOP
DATA	LOWERS converts string to lower case	STR\$
DEF FN define function	MAX gets largest value	SYMBOL redefine character
DEFINT	MERGE	SYMBOL AFTER number of permissible UDGs
DEFSTR	MIDS	TAG mix text and graphics
DEFREAL	MODE	TAGOFF
DEGrees	MOVE cursor	TAN
DELETE	MOVER	TEST reports on INK value
DISable interrupts	NEW	TESTR
DIM	NEXT	TIME
DRAW line	ON GOSUB	TRON
DRAWR line to relative cursor position	ON GOTO	TROFF
EDIT	ON BREAK GOSUB	UNT
END	ON BREAK STOP	UPPERS converts to upper case
ENT tone	ON ERROR GOTO	VAL
ENVELOpe	ON SQ GOSUB	VPOS returns vert. of cursor
EOF test for end of file	OPENIN put file	WAIT until given I/O port returns particular value
ERASE	OPENOUT	WEND
ERROR number	ORIGIN start point for cursor	WHILE
ERL error line	PAPER	WIDTH
ERROR take error action with given number	PEEK	WINDOW
EVERY calls subroutine at regular intervals	PEN	WINDOW SWAP
EXP	PI	WRITE
FIX removes figs to right of decimal point	PLOT	XPOS horiz. pos. of cursor
FOR	PLOTR	YPOS
FRE	POKE	ZONE changes width of print zone
	POSition	
	PRINT	
	RADIAN	
	RANDOMIZE	
	READ	

called Shakespeare and Einstein and three children named Ravel, Archimedes and Monet who demonstrated the computers.

Several Japanese computer makers are launching models here this year, all using the MSX standard, designed to ensure software is compatible between computers. Asked about this, Mr Sugar said: "In my opinion the Japanese are not going to get a look in. It's what the computer can do that's important — and the support and software — not the operating system."

He contrasted the success of Sinclair, Acorn's BBC micro and US computers with those from Japan.

And he said of his own range: "We are quite happy to stand head-to-head with them."

William Poel, chairman of Amsoft, said 48K of the 64K of RAM was useable by the industry standard BASIC, which also featured interrupt handling and extensions for graphics and sound. A version of HiSoft's Pascal was available, along with an assembler/disassembler and machine code monitor.

Peripherals would include a pair of joysticks, module for additional ROMs and a modulator to allow the use of televisions instead of Amstrad's monitors.

The CPC 464 has three display

modes, using colours selected from a palette of 27 (including black):

mode	No. of INKs	Vert. pixels	Horiz. pixels	chars
normal	4	200	320	40 x 25
high res	2	200	640	80 x 25
multi-col	16	200	160	20 x 25

Colour: the screen border can be set to any pair of colours regardless of mode and can be steady or flashing, with user-definable repeat rates. Each screen INK can be set in the same way.

Windows: up to eight text windows and a graphics window can be used. **Sound:** the CPC464 uses a sound generator from General Instruments' AY8910 family. It gives three voices (channels), each of which can be independently set for tone and amplitude. White noise (i.e. for explosions) can be added. The three channels appear as left, right and centre — using the stereo extension jack and the computer's internal speaker produces a mixed mono output of seven octaves.

Input/output: edge connector for expansion and Centronics type printer, nine-pin joystick socket, six-pin socket for RGB etc, 3.5mm socket for stereo sound output, 5mm socket for power supply.

Cassette recorder is software switchable between 1K and 2K baud.

Keyboard unit is matt black with the alphanumeric keys — up to 32 user-definable — in black and others in blue (ENTER) and red and the numeric keypad on the right is below the cursor keys. The unit measures 580mm wide, 70mm high and 170mm deep and weighs 2.4kg.

Systems 3 and 4 in the range will have CP/M, the industry-standard operating system for business computers, and Logo, the educational language, built in, as well as a single 3in disc drive, claimed to hold about 150K on single-sided discs.

Monitors: both the green screen model (GT 64) and the colour model (640) contain the computer's power supply.

The keyboard unit and monitors are made in Korea, the joystick in Taiwan and power supply/modulator is made in the UK.

Game players?

From front page

middle-class parents are the kind of people most likely to buy home computers.

"They tend to buy them because they believe that it will give their children an advantage in life.

"But we also know that what actually happens is that the child — usually a boy — ends up using it solely for playing games.

"So much for the £125, £199 or even £399 investment in the child's future."

Mr Tillotson said the most important sources of information for potential buyers were people who already own micros.

He said: "For the first time, we have a large installed base of home computers in this country.

"When next Christmas rolls around and new purchasers ask the people next door whether it was worth buying a computer for the kids, I wonder what the answer will be.

"If the answer is 'no' then I sense the writing may be on the wall for home computers."

The survey also showed that only half of the people questioned could name a single home computer brand, despite an estimated £37m spent last year by the makers on advertising.

Sinclair and Commodore were, as expected, at the top with BBC, Atari and Apple next. Brands like Lynx and Oric were virtually unknown.

When prompted, Atari's name shot ahead of Sinclair's in people's minds. The theory is that, although the company spent relatively little on advertising, it is well known for its games players.

Mr Tillotson said: "There is still a tremendous ignorance about home computers.

"Spontaneous awareness of brands is low, brand images have barely formed and people's awareness and knowledge of even quite commonly used jargon is at a low level."

Respondents were shown a list of 18 terms, like "micro", "software" and "user-friendly". The highest awareness figure for any of them was 55 per cent, and that was the percentage of those who knew the word "micro".

Mr Tillotson said: "We didn't do anything clever in this part of the survey, like asking people to define the words they claimed to know — if they said they understood the meaning of

the word, we assumed that they were being honest.

"If, in fact, some of them weren't telling the whole truth, then the level of understanding out there is much worse than the figures show."

Last year 1.7m computers — total cost £300m were sold at an average price of £170.

Marketing Direction's study is called the GB Market for Home Computers, General Attitude Study, which is carried out each year. The company also has a more frequent study called the Personal Computer and Video Games Users Survey. Marketing Direction, 6 High Street, Thames Ditton, Surrey KT7 0RY

Black Box

From front page

letter from a boy who said he was paying a pound to a group for copies of games."

Microdeal had placed an initial order of 25,000 of the keys and a patent had been applied for.

Mr Symes said: "We will make it available on our future releases. We will then, hopefully, be ordering more and hope to bring the price down."

It would also be offered to other software companies. And Mr Symes said it would be priced to them at a figure which would recoup Microdeal's investment only.

He said: "After all, while people are playing other companies' ripped off games they are not buying ours."

And he said that Buzzard Bait had been chosen for the test because it was the best of the 41 being released. The others, which include a small number of conversions, are for the Commodore 64, Atari, Dragon, Aquarius, Spectrum, Oric, Electron, BBC, Tandy Colour and VIC-20.

Mr Symes said that eventually he wanted the software key available for all popular computers, if the demand was there. As it used the joystick port, it would only work on some if they had a joystick interface.

He explained that the key, packed with the cassette in a video-style case, had several routines, each of which cross-checked with another before running the game. A differently programmed key was needed for each game.

Even if a user managed to stop the game and list it, all he would see would be meaningless garbage, said Mr Symes.

Microdeal, 41 Truro Rd, St Austell, Cornwall PL25 5JE

Why settle for BASIC?

Having used BASIC, Pascal, Forth, Logo and various other languages, we fail to see why people settle for BASIC, which we feel is one of the most complicated.

Pascal and Forth, for example, are much easier to use because of proper programming structures which remove the need for complicated jumping. It is much easier to understand WHILE hungry, EAT than 10 IF hungry THEN eat: GOTO 10 — or at least we think so.

One version of BASIC which comes very close to being structured is BBC BASIC. However, it totally misses the point. What is the point in having procedures, functions and constructs like FOR... NEXT and REPEAT UNTIL when one still has to jump over a procedure (with GOTO) to stop it being inadvertently executed? Also the commands GOTO and GOSUB — the definite sins of structured programming — are in the language when they should really be redundant.

Normally there is no provision in BASIC for named procedures or subroutines, so programs begin to get totally unreadable when there are jumps and subroutine calls to line numbers.

And BASIC has no data type declaration facilities like Pascal and Forth. Programs tend to use variables of a very limited type. Admittedly, some BASIC variants can predefine variables to be string, real, integer or double precision. But with most popular home computers, such as the Atari, Commodore 64, VIC-20, Spectrum and BBC, this is impossible.

For most tasks integer arithmetic will suffice, and is usually much faster than real arithmetic. But the BBC requires a per cent sign after variables to denote integers, so making programs even more unreadable, with these per cent signs scattered all over the place. The Spectrum doesn't even have integer variables!

Another thing that adds to unreadability is the use of numbers to represent commands, as in *FX, VDU, PLOT and ENVELOPE on the BBC and the confusing use of POKE to control the graphics on unexpanded Commodore computers. What is wrong with simple English commands?

For Acorn to encourage the use of BBC BASIC in schools is totally naive. It is senseless to promote a language which is both BASIC and non-standard. Why not teach Logo or Pascal instead? What is this fascination with BASIC? Why don't people see the light?

We own Epson HX-20s and Jupiter Aces and for the Ace we have Pascal, Forth and the excellent assembler from Transam. To be honest, we have hardly used BASIC for months.

Our suggestion to you is to think very carefully about buying a decent language for whatever computer you own. It really is easy to use proper languages provided you have an open mind.

A. Hegedus and D. Sutton
East Sheen, London SW14

● This space is for you to sound off about the micro scene, to present bouquets, to hurl brickbats, or just to share your opinions or experiences. Contributions from individuals earn a fee. Send your views to Paul Liptrot, Editor, Home Computing Weekly, No.1 Golden Square, London W1R 3AB

COMPETITION

Must be won: 200 prizes of Outback, a new game from

PARAMOUNT SOFTWARE

Baby kargaroos are under threat from cunning swagmen in Outback, Paramount's new game for the VIC-20 and Commodore 64.

In-house author Jason Benhams puts you in charge of the Boss Roo who has to defend the outback.

You can win a copy of Outback. We've got 200 to give away — 100 each for the VIC-20 and Commodore 64 — to winners of our spot the difference competition.

According to Bob Horsham, Paramount's marketing director, a team effort is needed for top quality software. To aid this, the company is altering its headquarters to create a building equipped for film visuals, graphic design and research.

Outback costs £7.50 for the Commodore 64 and £5.50 for any VIC-20 — which means that the total prize value is £1,300.

Paramount, of 67 Bishopton Lane, Stockton on Tees, Cleveland TS18 1PU, also has Megawarz for the Commodore 64 (£7.50), Jogger (VIC-20, £5.50), Chocabloc (VIC plus 8K/16K, £6.50), Countdown (VIC plus 8K/16K, £5.50) and Castle of Doom and Sporting Decathlon (both £6.50 for the Dragon 32).

How to enter

Study the two cartoons and try to find all the differences. Mark the differences on cartoon B by circling them with a ballpoint pen and then fill in your name, full address, the number of differences you found and your computer. Please write clearly — if you are a winner, the coupon will be used as a label.

Seal the marked drawing and the coupon in an envelope and write clearly on the back of the envelope the number of differences you found and your computer: VIC-20 or Commodore 64. Do not enclose anything else.

Post your entry to Paramount Software Competition, Home Computing Weekly, No.1 Golden Square, London W1R 3AB.

Entries close at first post on Friday, May 4.

You may enter as many times as you wish, but all entries must be on the official coupon and cartoon; copies will not be accepted.

The winners will be the first 100 correct entries from VIC-20 owners of the Commodore 64 opened at random.

The solution and the names of the winners will appear in Home Computing Weekly and the prizes will arrive from Paramount within 28 days of the publication of that issue, or before.

Important: please follow these guidelines carefully. Incomplete entries cannot be accepted.

The rules

Entries close at first post on Friday, May 4 1984 and the guidelines in the How to enter section form part of the rules. Entries will not be accepted from employees of Argus Specialist Publications, Paramount Software and Alabaster Passmore & Sons. This restriction also applies to employees' families and agents of the companies.

Paramount Software Competition

Entry Coupon

Name _____

Address _____

_____ post code _____

Computer (VIC-20 or Commodore 64 only) _____

Number of differences found _____

Complete clearly; if you are a winner this will act as a label for your prize. Post to Paramount Software Competition, Home Computing Weekly, No.1 Golden Square, London W1R 3AB. Entries close at first post on May 4.



Chocky Egg by Dave Carlos and Jon Revis

Which came first, the chicken or the chocolate egg? This is a question which has puzzled scholars for centuries now.

The well known Cadbury group believe it was the chocolate egg while any farmer will claim the chicken was first. This program tries to solve the deadlock by making it quite plain that it was of course the worm which came first. For without worms there are no chickens to lay eggs and no eggs to become chickens.

The aim of this program is to see how many worms you can peck before you run out of chickens in the coop. If you manage to peck five worms from the 10 that come to the surface each day then you get to lay your chocolate egg and upon its hatching get another life.

Unfortunately the chicken you command is low down in the

Easter special Peck the worms and save your planet

So if the wiggly worm does stray towards the rocks our advice is to keep your chicken well clear!

Control is by pressing Z to move left and X to move right. If you wish to peck then press return. The way to eat worms is to get right over them and then peck just as they get to the surface.

If you are not right on the worm or don't peck at just the right time then you will have lost your chance with that worm.

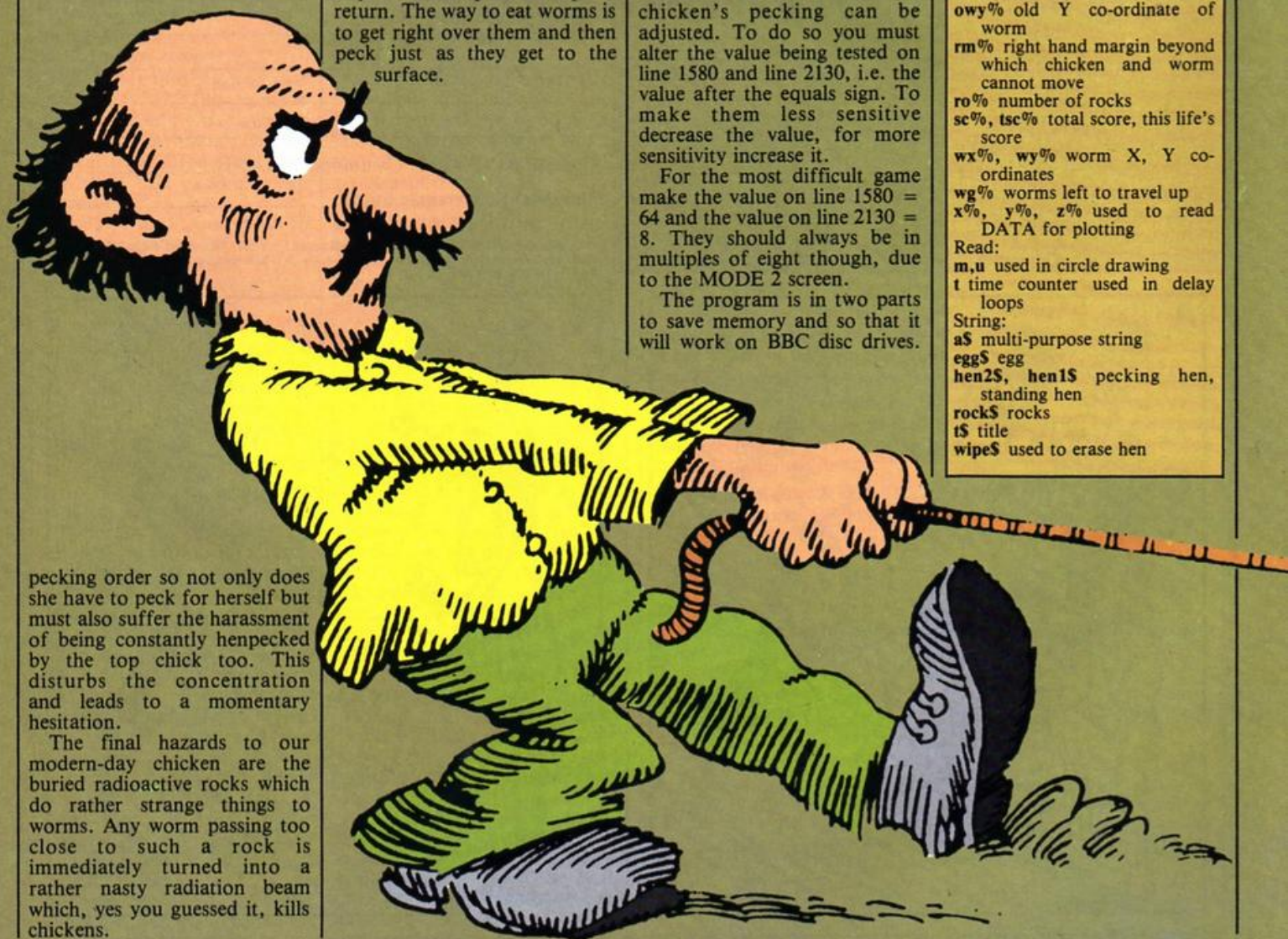
The sensitivity of both the worm to the rocks and the chicken's pecking can be adjusted. To do so you must alter the value being tested on line 1580 and line 2130, i.e. the value after the equals sign. To make them less sensitive decrease the value, for more sensitivity increase it.

For the most difficult game make the value on line 1580 = 64 and the value on line 2130 = 8. They should always be in multiples of eight though, due to the MODE 2 screen.

The program is in two parts to save memory and so that it will work on BBC disc drives.

Variables

Integer:
co% multi purpose counter
c% colour code
col% colour selected at random
col2% different colour from col%
flag% used with modulus to decide which worm to print
fl% test for user input
fr% rock flag = -1 if a rock hit, otherwise = 0
lives% number of lives left
ox%, owx% old X co-ordinates of chicken, worm
owy% old Y co-ordinate of worm
rm% right hand margin beyond which chicken and worm cannot move
ro% number of rocks
sc%, tsc% total score, this life's score
wx%, wy% worm X, Y co-ordinates
wg% worms left to travel up
x%, y%, z% used to read DATA for plotting
Read:
m,u used in circle drawing
t time counter used in delay loops
String:
a\$ multi-purpose string
egg\$ egg
hen2\$, hen1\$ pecking hen, standing hen
rock\$ rocks
t\$ title
wipe\$ used to erase hen



pecking order so not only does she have to peck for herself but must also suffer the harassment of being constantly henpecked by the top chick too. This disturbs the concentration and leads to a momentary hesitation.

The final hazards to our modern-day chicken are the buried radioactive rocks which do rather strange things to worms. Any worm passing too close to such a rock is immediately turned into a rather nasty radiation beam which, yes you guessed it, kills chickens.

Special: Form our

Listing 1 — Chocky Egg, part 1, defines characters

```

10 PROCchars
20 MODE2
30 VDU23;8202;0;0;0;
40 COLOUR132
50 CLS
60 COLOUR1
70 PRINTTAB(0,3)STRING$(20,CHR$(232));TAB(0,27)STRIN
G$(20,CHR$(236))
80 COLOUR13
90 PRINTTAB(9,5);CHR$224;CHR$225;TAB(9,24);CHR$224;C
HR$225
100 COLOUR10
110 PRINTTAB(5,10)"Chocky Egg";TAB(0,14)"Easter Enter
tainment"
120 COLOUR3
130 PRINTTAB(1,18)"Z = left  X = right";TAB(3,20)"Ret
urn = Peck"
140 COLOUR0
150 VDU28,3,30,16,25
160 CLS
170 PAGE=&1200: REM ** ONLY NEEDED BY DISC USERS ***
180 CHAIN"EGG2"
190 DEFPROCchars
200 VDU23,224,240,128,162,162,162,187,128,240
210 VDU23,225,0,0,181,166,165,181,0,0
220 VDU23,226,0,0,0,0,7,15,31,29
230 VDU23,227,62,63,95,95,120,112,0,0
240 VDU23,228,0,0,0,0,192,224,224,240
250 VDU23,229,184,112,240,224,0,0,0,0
260 VDU23,230,0,0,0,0,0,32,32,32
270 VDU23,231,64,64,0,0,0,0,224,161
280 VDU23,232,48,56,12,24,48,24,12,4
290 VDU23,233,0,0,0,0,176,152,136,220
300 VDU23,234,0,0,0,0,0,0,0,2
310 VDU23,235,1,0,32,32,0,0,0,0
320 VDU23,236,12,28,48,24,12,24,48,32
330 VDU23,237,64,128,0,0,0,0,0,0
340 VDU23,238,0,0,28,54,55,63,63,29
350 VDU23,239,14,15,7,3,0,0,0,0
360 VDU23,240,20,28,0,0,0,64,192,192
370 VDU23,241,0,0,0,0,0,0,0,3
380 VDU23,242,0,0,0,0,160,160,160,240
390 VDU23,243,0,0,0,0,8,8,0,2
400 VDU23,244,1,0,0,0,0,0,0,0
410 VDU23,245,28,28,73,0,8,93,62,28
420 VDU23,246,0,34,54,127,119,34,0,0
430 VDU23,250,0,0,20,56,4,52,0,0
440 VDU23,251,0,8,8,6,122,72,16,0
450 VDU23,252,8,20,34,65,129,130,108,16
460 VDU23,255,255,255,255,255,255,255,255
470 ENVELOPE1,2,127,-1,-2,1,50,50,100,0,-2,-2,127,80
480 ENVELOPE2,2,129,65,33,50,40,30,100,-1,-2,-1,127,2
0
490 ENVELOPE3,133,8,4,8,3,1,1,126,0,0,-10,126,0
500 ENVELOPE4,1,0,0,0,0,0,0,126,-1,0,-5,126,0
510 ENDPROC

```

Listing 1 sets all the user-defined characters and the sound envelopes which are then put to use in Listing 2. This is a good technique for saving memory on the BBC machine.

We have also put spaces into the listing after every BBC word. These are not strictly necessary and can be left out if you wish. They are there for clarity only (this also applies to the REMs).

The program has been tested on the BBC Model B and Electron micros. On the Electron the progress is rather slow but the game is actually no easier. If the BBC has discs then you should include the line in listing 1 which sets PAGE to &1200.

The program has few REMarks in order to save memory and to make things as fast as possible but the PROCEDURE names are supposed to be self explanatory and should help you to see what is happening.

The use of strings to change both graphics colours and to move around the screen is a little unusual. They were used to make it easy to print the multi-coloured characters, some of which need 10 actual characters to be printed. This technique can save a lot of memory if used wisely.

You will also search in vain for the program title. It is held

co-ordinate values will give a fairly small answer. We are not really interested in whether the direction is left or right so the ABS function converts this to a positive value.

There are two initialisation routines setting variables, one for the whole program (init1)

(worm\$(0) and worm\$(1)) we can print either from a single line of BASIC. Then by only allowing f1% to have values of 0 and 1 (which is what the MOD 2 does) we print first one then the other worm in rotation. This gives us the wiggle if we define two opposite worms to put in the array.

in ASCII codes and READ into the t\$. Greatest care needs to be taken over typing the DATA lines. A single mistake here can be very hard to find and can have highly unpredictable results.

The use of an absolute value (ABS) to test the proximity of the chicken, and of the rocks, to the worm is also a little unusual. The technique is based on the idea that if they are close together then subtracting the x

and one which resets everything before each new life or sheet (init2).

The function FNrock tests to see if the worm is close to one of them. If it is then the value -1 (true on a BBC) is returned, if not then 0 is returned and the progr continues accordingly.

The other interesting thing about the worm is its wiggle. By putting the worms into an array

Two great games from HCW
regulars. One works on both
the BBC and Electron and the
second is BBC only

How it works PROCedures

- 210 background prints all the background features before each sheet
- 390 lines draws planks on hen house
- 490 sun plots sun and rays
- 620 lives prints number of chickens left in henhouse
- 690 title (X%,Y%) prints coloured title in x,y position specified
- 800 cluck makes clucking noises and printing
- 920 plot (N%) reads data statements for various plotting and colour changes required
- 1000 walkhen moves hen in desired direction
- 1080 input gets key inputs from user
- 1160 strings defines various character strings from DATA statements
- 1280 read (Z%) used by PROCstrings to READ DATA
- 1430 moveworm moves worm and decides which worm to print
- 1620 shoot tries to shoot hen if worm touches a rock
- 1740 delay(t) delays for 't' seconds
- 1780 reset resets worm to bottom of the screen
- 1830 printrocks prints rocks
- 1900 dead explodes chicken if hit
- 2030 peck makes chicken peck ground
- 2110 food checks to see if worm is close enough to chicken and if it is pecking at time
- 2190 scores prints various scores
- 2250 init1 first initialisation for whole game
- 2290 init2 initialisation for each life
- 2330 egg prints egg and congratulations message if given a new life
- 2520 end finishes game and offers another go
- 1550 FNrock checks to see if worm has hit rock



Alien Fallout by Shingo Sugiura

You are the sole defender of the planet Gorgon. All the others in your position have been wiped out in previous attacks by the aliens. How long can you protect your people?

Type in Listing 3 and SAVE it under the name ALIEN and then type in Listing 4 and SAVE it under the name FALLOUT just after ALIEN.

If your system is tape based it is vitally important that you SAVE FALLOUT before you run it as it will over-write itself and you'll have to type it in all over again!

How it works Alien

10-40 REM statements
50 call a PROCEDURE which defines characters and envelopes
60 select MODE7
70 print title page
80 CHAIN in main program
100-220 PROCEDURE to print the title page
310-520 define characters

However, once you have typed it all in — and provided it's correctly entered — the first program will automatically reset PAGE to the appropriate value and CHAIN in the second program.

When the main program is loaded a brief set of instructions will appear and it will wait for you to press the space bar.

Then the screen will clear and you will see the aliens at the top with your tiny ship at the bottom of the screen.

Press Z, X and shift to move left, right and fire respectively. You must prevent them from reaching the surface for as long as you can.

Variables

death number of dead aliens
landed boolean to indicate your death
fired boolean to indicate whether there's a missile on the screen or not
x% X co-ordinate of your ship
al%(X) array of holding the position of the aliens
bx% X co-ordinate of missile
by% Y co-ordinate of missile
score% current score
se(X) array of scores

When your spacecraft is destroyed and your score is in the top eight you will be asked to enter your name and the hall of fame will be displayed.

The sound can be switched off or on at any time during the game by pressing Q or S.

Note: When you type in the program it is essential to enter the £ sign, in line 1280, as a hash symbol. This is brought about by the fact that the ASCII code for hash on the BBC corresponds to the code for £ on the printer.

Hints on conversion

I have not used many BBC specific commands so conversion should not prove too difficult. However, here are some hints:

- Replace all PROCxxx with GOSUBSs
- Replace all REPEAT UNTIL loop with GOTOs
- The short machine code routine is a simple routine which returns the code of the character at the current cursor position
- *FX210,1 switches off all sounds
- *FX210 switches them back on
- The screen format is 20 x 32 and allows 16 colours

```

100 PROCwalkhen
110 REPEAT
120 PROCinput
130 IF RND(40) = 1 PROCcluck
140 UNTIL wg%=<0 : lives% = lives%-1
150 UNTIL lives% = 0
160 PROCend
170 CLG
180 VDU 4
190 END
200
210 DEF PROCbackground
220 RESTORE 330
230 VDU 26
240 PROCplot(48)
250 VDU 5 : MOVE 1060,698 : PRINT hen1$ : VDU 4
260 PROCscores
270 PROCsun
280 PROCclives
290 PROCtitle(300,1000)
300 *FX9,10
310 *FX10,10
320 ENDPROC
330 DATA 18,0,6,4,0,512,85,1279,0,85,1279,512,18,0,4,
4,1279,1023,85,0,512,85,0,1023,18,0,3,4,992,512,4,992,7
68,85,1216,512,85,1216,832
340 DATA 4,1225,840,4,944,752,85,944,772,4,1225,840,8
5,1225,860,4,992,569,4,928,512,85,908,512,4,992,569,85,
992,589
350 DATA 18,0,0,4,1216,512,5,1216,832,5,944,752,5,944
,772,5,1225,860,5,1225,840,5,1216,832
360 DATA 4,992,768,5,992,512,4,992,569,5,928,512,5,90
8,512,5,992,589
370 DATA 18,0,7,4,1040,630,4,1040,704,85,1172,630,85,
1172,704,18,0,0,5,1040,704,5,1040,630,5,1172,630,5,1172
,704
380
390 DEF PROClines
400 GCOL 0,0
410 x% = 1000
420 FOR y% = 768 TO 828 STEP 10
430 MOVE x%,y%
440 PLOT 29,x%,512
450 x% = x%+32
460 NEXT
470 ENDPROC
480
490 DEF PROCsun
500 VDU 29,128,896;
510 GCOL 0,3
520 RX = 50
530 NX = 0
540 FOR a = 0 TO 2*PI-PI/RX STEP PI/RX
550 m = NX*0.2 : IF m = INT(m) THEN RX = RX*3
560 MOVE 0,0 : DRAW RX* COSa,RX* SINA
570 NX = NX+1
580 RX = 50
590 NEXT : VDU 29,0;0;
600 ENDPROC
610
620 DEF PROCclives
630 FOR co% = lives%-1 TO 1 STEP -1
640 MOVE (1280-co%*196),930
650 PRINT hen2$
660 NEXT
670 ENDPROC
680
690 DEF PROCtitle(X%,Y%)
700 MOVE X%-96,Y% : PRINT egg$
710 MOVE X%,Y%

```

How it works Fallout

10 initialise variables and assemble a short machine routine
20 select MODE7 and print instructions
40-50 main loop
170-320 game itself
330-410 death
420-500 move aliens
510-580 move missile
590-660 hit an alien
670-730 initialise
740-900 set up screen
910-1230 hall of fame
1240-1320 assemble a short machine code routine
1330-1360 delay routine
1370-1520 instructions

Listing 2 — Chocky Egg, part 2, main program

```

0 REM *****
1 REM ***
2 REM *** CHOCKY EGG ***
3 REM *** by ***
4 REM *** Dave Carlos ***
5 REM *** & ***
6 REM *** Jon Revis ***
7 REM *** for ***
8 REM ***Home Computing Weekly***
9 REM *****
10 REM *** CHOCKY EGG SECOND PROG ***
20 MODE 2
30 VDU 23;8202;0;0;0;5
40 PROCinit1
50 PROCstrings
60 REPEAT
70 PROCinit2
80 PROCbackground
90 PROCreset

```

```

720 GCOL 0,3
730 PRINT t$
740 MOVE X%+8,Y%+4
750 GCOL 0,1
760 PRINT t$
770 MOVE X%+660,Y% : PRINT egg$
780 ENDPROC
790
800 DEF PROCcluck
810 RESTORE 890
820 SOUND 1,1,90,2
830 PROCplot(10)
840 VDU 224,225
850 PROCdelay(.1)
860 GCOL 0,4 : MOVE 720,660 : VDU 255,255
870 PROCplot(9)
880 ENDPROC

```



```

890 DATA 18,0,7,4,984,672,21,848,710,4,984,656,21,896
,675,4,984,640,21,896,615,4,984,630,21,880,555,4,720,66
0
900 DATA 18,0,4,4,984,672,21,848,710,4,984,656,21,896
,675,4,984,640,21,896,615,4,984,630,21,880,555
910
920 DEF PROCplot(NX)
930 FOR co% = 1 TO NX
940 IF co% = 38 PROClines
950 READ x%,y%,z%
960 IF x% = 18 THEN VDU 18,y%,z% ELSE VDU 25,x%,y%,z%
;
970 NEXT
980 ENDPROC
990
1000 DEF PROCwalkhen
1010 MOVE ox%,Y%
1020 PRINT wipe$
1030 MOVE X%,Y%
1040 PRINT hen1$
1050 ox% = X%
1060 ENDPROC
1070
1080 DEF PROCinput : fl% = 0
1090 IF INKEY-98 AND X%>32X% = X%-32 : fl% = 1
1100 IF INKEY-67 AND X%<rmX% = X%+32 : fl% = 1
1110 IF fl% = 1 PROCwalkhen ELSE PROCdelay(.01)
1120 IF INKEY-74 PROCpeck
1130 PROCmoveworm
1140 ENDPROC
1150
1160 DEF PROCstrings
1170 RESTORE 1350
1180 PROCread(49) : hen2$ = a$
1190 PROCread(49) : hen1$ = a$
1200 PROCread(9) : wipe$ = a$
1210 PROCread(13) : rock$ = a$
1220 PROCread(9) : t$ = a$
1230 PROCread(3) : worm$(0) = a$
1240 PROCread(3) : worm$(1) = a$
1250 PROCread(8) : egg$ = a$
1260 ENDPROC
1270
1280 DEF PROCread(Z%)
1290 a$ = ""
1300 FOR c% = 0 TO Z%
1310 READ co%
1320 a$ = a$+ CHR$(co%)
1330 NEXT
1340 ENDPROC
1350 DATA 18,0,3,226,8,18,0,1,230,8,18,0,0,234,18,0,3,
228,8,18,0,3,229,8,18,0,1,233,8,18,0,0,237,8,18,0,0,
3,227,8,18,0,1,231,8,18,0,0,235
1360 DATA 18,0,3,238,8,18,0,1,240,8,18,0,0,243,18,0,3,
228,8,18,0,3,229,8,18,0,1,242,8,18,0,0,237,8,18,0,0,
3,239,8,18,0,1,241,8,18,0,0,244
1370 DATA 18,0,4,255,255,8,18,0,255,255
1380 DATA 18,0,11,250,8,18,0,12,251,8,18,0,0,252
1390 DATA 67,72,79,67,75,89,32,69,71,71
1400 DATA 18,0,5,232,18,0,5,236
1410 DATA 18,0,1,245,8,18,0,3,246
1420
1430 DEF PROCmoveworm
1440 MOVE owx%,owy% : GCOL 0,6 : VDU 255
1450 IF wy% = 0 PROCprintrocks
1460 MOVE wx%,wy% : PRINT worm$(flag%)
1470 flag% = (flag%+1) MOD 2
1480 owx% = wx% : owy% = wy%
1490 IF wy%>504 THEN PROCfood : PROCreset ELSE wy% =
wy%+12
1500 IF RND(2) = 1wx% = wx%+16 ELSE IF RND(2) = 2wx% =
wx%-16
1510 IF wx%<16wx% = 16 ELSE IF wx%>rm%-16wx% = rm%-16
1520 IF wy%>200 IF FNrock PROCshoot
1530 ENDPROC

```

```

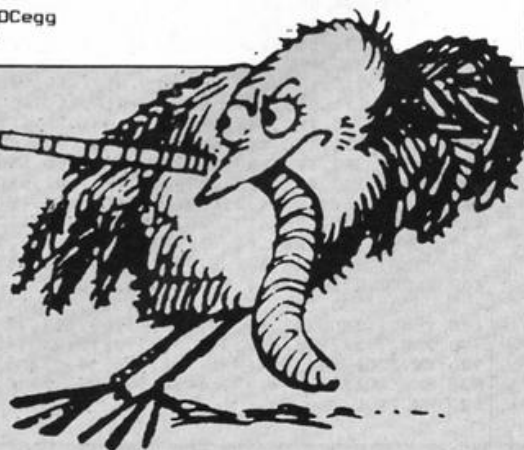
1670 GCOL 0,6
1680 MOVE wx%+32,wy%
1690 PLOT 29,wx%+32,504
1700 IF (wx% DIV 32)-1 = X% DIV 32 THEN PROCdead
1710 PROCreset
1720 ENDPROC
1730
1740 DEF PROCdelay(t)
1750 co% = TIME : REPEAT UNTIL TIME -co%>t*100
1760 ENDPROC
1770
1780 DEF PROCreset
1790 wy% = 0
1800 wx% = RND(23)*32
1810 ENDPROC
1820
1830 DEF PROCprintrocks
1840 FOR co% = 0 TO ro%
1850 MOVE RX%(co%),RY%(co%)
1860 PRINT rock$
1870 NEXT
1880 ENDPROC
1890
1900 DEF PROCdead
1910 VDU 19,6,14,0,0,0,19,4,11,0,0,0
1920 FOR co% = 1 TO 45
1930 MOVE X%+64,504
1940 GCOL 0,co%
1950 DRAW X%-200+ RND(400),Y%+ RND(400)
1960 SOUND 1,1,co%,2
1970 NEXT
1980 VDU 20
1990 *FX15,1
2000 wg% = -1
2010 ENDPROC
2020
2030 DEF PROCpeck
2040 MOVE X%,Y% : PRINT wipe$
2050 MOVE X%,Y% : PRINT hen2$
2060 SOUND 0,-15,6,2
2070 MOVE X%,Y% : PRINT wipe$
2080 MOVE X%,Y% : PRINT hen1$
2090 ENDPROC
2100
2110 DEF PROCfood
2120 *FX15,0
2130 IF ABS((X%-16)-wx%)<=16 AND INKEY-74 THEN tsc% =
tsc%+1 : S% = S%+1 : SOUND 1,3,200,5
2140 wg% = wg%-1
2150 PROCscores
2160 IF tsc% = 5 wg% = -1 : lives% = lives%+2 : PROCegg
g : IF lives%>6 lives% = 6
2170 ENDPROC
2180
2190 DEF PROCscores
2200 VDU 4,28,15,30,19,18
2210 COLOUR 6 : COLOUR 134 : PRINT TAB(3,4) SPC 2; TAB
(3,10) SPC 2
2220 COLOUR 0 : PRINT TAB(0,0)"Worms"; TAB(0,1)"Eaten
"; TAB(2,2) STR$(sc%+tsc%); TAB(0,5)"Worms"; TAB(0,6)"
Left"; TAB(2,7) STR$(wg%); " "; TAB(0,9)"Score"; TAB(2,1
0);S% : VDU 26,5
2230 ENDPROC
2240
2250 DEF PROCinit1
2260 rm% = 784 : ro% = RND(2)+1 : DIM RX%(ro%),RY%(ro%
),worm$(1) : FOR co% = 0 TO ro% : RX%(co%) = RND(850) :
RY%(co%) = RND(280)+200 : NEXT : flag% = 0 : sc% = 0 :
lives% = 3 : S% = 0
2270 ENDPROC
2280
2290 DEF PROCinit2
2300 X% = rm% : Y% = 572 : ox% = X% : wx% = 640 : wy%
= 0 : owx% = wx% : owy% = wy% : wg% = 10 : tsc% = 0
2310 ENDPROC
2320
2330 DEF PROCegg
2340 VDU 26

```

```

1540
1550 DEF FNrock
1560 flr% = 0
1570 FOR co% = 0 TO ro%
1580 IF ABS(wx%-RX%(co%))<48 AND ABS(wy%-RY%(co%))<16
THEN flr% = -1
1590 NEXT
1600 = flr%
1610
1620 DEF PROCshoot
1630 GCOL 0,1 : MOVE wx%+32,wy%
1640 PLOT 29,wx%+32,504
1650 SOUND 0,4,4,3
1660 PROCdelay(.5)

```




```

2350 MOVE XZ+112,540 : PRINT egg$
2360 PROCdelay(3)
2370 GCOL 0,132 : CLG
2380 PROCTitle(300,984)
2390 FOR NZ = 896 TO 32 STEP -64
2400 FOR MZ = 0 TO 1216 STEP 128
2410 colX = RND(15) : col2X = colX+5 MOD 15
2420 SOUND 1,2,colX*10,1
2430 MOVE MZ,NZ : VDU 18,0,colX,245,8,18,0,col2X,246
2440 NEXT ,
2450 VDU 4
2460 COLOUR 0 : COLOUR 135
2470 PRINT TAB(2,15) SPC 16; TAB(2,16)" ! EGG-CELLENT
!"; TAB(2,17) SPC 16
2480 VDU 5
2490 PROCdelay(5)
2500 ENDPROC
2510
2520 DEF PROCend
2530 GCOL 0,132
2540 CLG
2550 PROCTitle(300,1000)
2560 PROCTitle(300,100)
2570 VDU 4
2580 COLOUR 3 : COLOUR 132
2590 PRINT TAB(3,10)"Don't feel too"; TAB(4,12)"Henpeck
ed !"; TAB(1,15)"Your score was :";SZ; TAB(3,20)"Pres
s any key"; TAB(3,22)"to try again"
2600 *FX15,0
2610 coX = GET
2620 RUN
2630 ENDPROC
>

```

Listing 3 — Alien, defines characters for Alien Fallout

```

10 REM ...Alien Fallout V2...
20 REM ..By Shingo Sugiura..
30 REM
40
50 PROCdefine
60 MODE7
70 PROCinst
80 PAGE=&1900:CHAIN"FALLOUT"
90
100 DEFPROCinst
110 PRINTCHR$129CHR$157CHR$141CHR$131TAB(13)"Alien Fa
llout"
120 PRINTCHR$129CHR$157CHR$141CHR$131TAB(13)"Alien Fa
llout"
130 PRINT'CHR$134TAB(11)"By Shingo Sugiura"
140 PRINT'CHR$141CHR$130TAB(13)"INSTRUCTIONS"
150 PRINTCHR$141CHR$130TAB(13)"INSTRUCTIONS"
160 PRINT'SPC13"Z ... Left."
170 PRINTSPC13"X ... Right."
180 PRINTSPC9"SHIFT ... Fire."
190 PRINTSPC13"Q ... Sound off."
200 PRINTSPC13"S ... Sound on."
210 IF PAGE<>&1900 THEN PROCTape ELSE PROCdisc
220 ENDPROC
230 DEFPROCTape
240 PRINTTAB(0,23)CHR$134CHR$136"Please leave tape re
corder running."
250 VDU28,10,20,30,17
260 ENDPROC
270 DEFPROCdisc
280 PRINTTAB(3,20)CHR$134CHR$136"Press the SPACE BAR
to continue."
290 REPEAT UNTIL GET=32
300 ENDPROC
310 DEFPROCdefine
320 VDU23,224,66,36,60,126,90,126,102,165,17,6
330 VDU23,225,24,24,24,189,189,255,255,153
340 VDU23,226,24,48,24,48,24,48,24,48
350 VDU23,227,&7C,&44,&44,&FE,&E2,&E2,&E2,&00
360 VDU23,228,&80,&80,&80,&E0,&E0,&E0,&FE,&00
370 VDU23,229,&10,&10,&10,&1C,&1C,&1C,&1C,&00
380 VDU23,230,&FE,&82,&80,&FC,&E0,&E2,&FE,&00
390 VDU23,231,&FE,&82,&82,&E2,&E2,&E2,&E2,&00
400 VDU23,232,&FE,&80,&80,&FC,&E0,&E0,&E0,&00
410 VDU23,233,&FE,&8E,&8E,&8E,&82,&82,&FE,&00
420 VDU23,234,&82,&82,&82,&E2,&E2,&E2,&FE,&00
430 VDU23,235,&FE,&10,&10,&1C,&1C,&1C,&1C,&00
440 VDU23,236,238,136,136,232,40,40,238,0
450 VDU23,237,238,170,170,175,169,169,233,0
460 VDU23,238,112,64,66,112,66,64,112,0
470 VDU23,239,231,164,164,247,148,148,151,0
480 VDU23,240,119,69,69,117,69,69,117,0
490 VDU23,241,0,85,255,255,255,255,255,255
500 ENVELOPE2,4,0,0,0,1,1,1,126,-4,-1,-4,126,80
510 ENVELOPE1,2,-2,-2,-1,10,10,50,126,-4,-4,-4,126,0
520 ENDPROC

```

Listing 4 — Fallout, Alien Fallout main program

```

10PROCinit:PROCase
20MODE7:PROCinst
30MODE2
40REPEAT
50MODE2:VDU23;10,32;0;0;0;
60height%=2:score%=0:screen%=0
70REPEAT
80PROCscreen
90PROCmain
100UNTIL landed
110PROCdeath
120PROCwait(8000):*FX15
130MODE7
140PROCTable
150UNTIL FALSE
160END
170DEFPROCmain
180death%=0:landed=FALSE:fired=FALSE
190c%=1:REPEAT
200IF INKEY(-17) THEN *FX210,1
210IF INKEY(-82) THEN *FX210
220IF INKEY(-98) x%=x%+(x%>0)
230IF INKEY(-67) x%=x%-(x%<17)
240IF INKEY(-1)ANDfired=FALSE PROCfire
250VDU17,1,31,x%,30:PRINTship$;
260IF fired PROCmissile
270IF al(c%)<>0 AND RND(1)>.3 PROCdescend
280IF al(c%)>28 landed=TRUE
290c%=c%+1:IF c%>18 c%=1
300VDU17,7,17,132,31,0,2:PRINT;score%:COLOUR128
310UNTIL landed OR death%=18
320ENDPROC
330DEFPROCdeath:RESTORE
340FOR music=1 TO 13
350READ A,B,C
360SOUND1,A,B,C:SOUND2,A,B+48,C
370NEXT
380ENDPROC
390DATA2,21,15,0,0,1,2,21,13,0,0,1
400DATA2,21,3,0,0,1,2,21,15,2,5,10
410DATA2,33,7,2,21,15,2,5,10,2,33,7,2,21,15
420DEFPROCdescend
430VDU17,2,31,c%,al(c%),32
440al(c%)=al(c%)+1:VDU31,c%,al(c%),224
450ENDPROC
460DEFPROCfire
470bx%=x%+1:by%=30
480SOUND1,1,100,1
490fired=TRUE
500ENDPROC
510DEFPROCmissile
520VDU31,bx%,by%,32
530by%=by%-1
540IF by%<3 fired=FALSE:ENDPROC
550VDU31,bx%,by%:CALLcode
560VDU17,3,226
570IF ?&70<>32 THEN PROChit
580ENDPROC
590DEFPROChit
600score%=score%+10
610SOUND0,2,100,1
620fired=FALSE
630al(bx%)=0
640VDU31,bx%,by%,32
650death%=death%+1
660ENDPROC
670DEFPROCinit:*T.
680ship$=" "+CHR$225+" "
690DIMal(18),sc(8):names=&F00
700FOR A=0 TO 7
710$(names+A*15)="Shingo soft":sc(A)=500-A*50
720NEXT
730ENDPROC
740DEFPROCscreen:CLS
750height%=height%+2:screen%=screen%+1:x%=10
760IF height%>10 height%=12
770VDU28,0,2,19,0,17,132,12,26,17,6
780VDU31,4,0,227,228,229,230,231,32,232,227,228,228,2
33,234,235
790VDU17,5,31,0,1,236,237,238,17,7:PRINTTAB(0,2);scor
e%
800VDU17,5,31,15,1,236,239,240,31,15,2,17,7:PRINT;scr
een%:COLOUR128
810COLOUR2
820FOR A=0 TO 18
830VDU31,A,31,241
840NEXT
850FOR A=1 TO 18
860ay%=RND(height%)+height%:al(A)=ay%
870VDU31,A,ay%,224
880NEXTA
890VDU17,1,31,x%,30:PRINTship$
900ENDPROC
910DEFPROCTable

```



```

920PROCammend:CLS
930PRINTCHR$129CHR$157CHR$130CHR$141TAB(5)"ALIEN FALL
OUT HALL OF FAME"
940PRINTCHR$129CHR$157CHR$130CHR$141TAB(5)"ALIEN FALL
OUT HALL OF FAME"
950PRINTTAB(10)CHR$134CHR$141"Today's Greatest"
960PRINTTAB(10)CHR$134CHR$141"Today's Greatest"
970FOR I=0 TO 7
980VDUI+49,46:PRINTTAB(6);sc(I);TAB(12)"... ";$(nam
es+I*15)'
990NEXTI
1000PRINTTAB(2,23)CHR$134CHR$136"Press the SPACE BAR t
o replay.";
1010REPEAT
1020REPEAT
1030A=GET
1040UNTIL A=32 OR A=81 OR A=83
1050IF A=81 THEN *FX210,1
1060IF A=83 THEN *FX210
1070UNTIL A=32
1080ENDPROC
1090DEFFPROCammend
1100IF score%<=sc(7) ENDPROC
1110FOR I=7 TO 0 STEP-1
1120IF score%>sc(I) sc(I+1)=sc(I):$(names+(I+1)*15)=$(
names+I*15):fix=I
1130NEXT
1140sc(fix)=score%
1150PRINTTAB(6,2)CHR$134CHR$141"Congratulations!!"
1160PRINTTAB(6,3)CHR$134CHR$141"Congratulations!!"
1170PRINTTAB(6,8)CHR$129"Your score of ";score%
1180PRINTTAB(0,10)CHR$129"qualifies for the Hall of Fa
me."
1190PRINTTAB(4,13)CHR$131"Please enter your name."
1200VDU31,5,15,134,157,129,31,26,15,156,31,9,15:*FX15
1210!&1000=names+fix*15:7&1002=14:7&1003=32:7&1004=127
1220X%=0:Y%=&10:A%=0:CALL&FFF1
1230ENDPROC
1240DEFFPROCass:osbyte=&FFF4
1250FOR pass=0 TO 2 STEP2:P%=&E00
1260[OPT pass
1270.code
1280LDA#135:JSR osbyte
1290STX#70
1300RTS
1310]NEXT pass
1320ENDPROC
1330DEFFPROCwait(T)
1340FOR delay%=0 TO T
1350NEXT delay%
1360ENDPROC
1370DEFFPROCinst
1380PRINTCHR$129CHR$157CHR$141CHR$131TAB(13)"Alien Fal
lout"
1390PRINTCHR$129CHR$157CHR$141CHR$131TAB(13)"Alien Fal
lout"
1400PRINTCHR$133TAB(11)"By Shingo Sugiura"
1410PRINT"" You are the sole defender of the"
1420PRINT"planet GORGON. All the others have been"
1430PRINT"destroyed in previous attacks by the"
1440PRINT"aliens. They attack in strict formation"
1450PRINT"so shooting them is easy, it's a matter"
1460PRINT"of shooting them all..."
1470PRINT"" You must defend your home planet as"
1480PRINT"long as possible. The last few"
1490PRINT"survivors depend on you."
1500PRINTTAB(3,23)CHR$134CHR$136"Press the SPACE BAR t
o play.";
1510REPEAT UNTIL GET=32
1520ENDPROC

```

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SOFTWARE REVIEWS

Jogging/ Sidewinder Sord M5 £8.95

Computer Games, Goldings Hill,
Loughton, Essex IG10 2RR

In the first game you control John, who goes jogging every morning. He wants to win the big race next week. A rival, however, is trying to interfere. He digs holes in the road, drops apples in his path, and uncages a very unfriendly crow.

You will be pleasantly surprised when you run this game. John is a brightly coloured, well-defined character and as he waves his arms and legs, background scrolls to give the impression of movement. You can make him run, stop and, somehow, go up and down!

In Sidewinder, half of the screen is the sky and bottom half is the instrument panel. The sky has dozens of dots — enemy helicopters, jet planes, prop planes. You have to destroy as many of them as you can using your sidewinder missiles before your fuel runs out. Of course, before this happens you must land.

Although both these are written in BASIC, they feature good graphics and sound. They're obviously not as sophisticated as cartridge games, but represent good value for money. S.S.

instructions	100%
playability	70%
graphics	70%
value for money	80%



Ghouls 32K BBC £7.95

Micro Power, 8/8a Regent St,
Chapel Allerton, Leeds LS7 4PE

Another high standard Program Power game. Cassette presentation is very good and instructions are quite adequate. As the game loads we can hear spooky music

and the screen display changes colour, making the long loading much more interesting.

Starting at the bottom, the idea is to reach the top and enter the next room of the creepy mansion. During your trip you have to eat titbits to gain extra points, avoid poison-smeared spikes and bouncing spiders. Your journey is made more difficult by moving platforms,

contracting floorboards and powerful springs. If you think that sounds easy, there's a time limit and, if you fail to reach the top, you shrivel up into a little pile.

Graphics are very good indeed. The slightest things have been thought of. When you die, the ghost who chases you around the screen smiles. Four levels have to be accomplished before you gain an extra life. The first three are deadly, but the

fourth... who knows?

Addictive and exciting. An interesting feature is that when you lose a life the screen moves away sideways and reappears in a spin to the centre. D.B.

instructions	85%
playability	90%
graphics	95%
value for money	90%



Jet Power Jack 32K BBC £7.95

Micro Power, 8/8a Regent St,
Chapel Allerton, Leeds LS7 4PE

Jack has been captured by the evil warlord Nogrob. You have to collect fuel pods from one side of the garage and return to the other side to refuel the waiting starship. Just to add excitement, Jack has to avoid nasty space Googies and finally, yes, you've guessed, prepare yourself, it's... Wilfred the hideous Yugg monster. To add to this impossible task, the sides of each ledge are live. Touching them will cause Jack to plummet to his death.

Is this game difficult? You're not kidding. After plenty of practice I finally got the hang of moving Jack around. Now, I'm

starting to play the game. If you like challenges you'll like this. Presentation is of the high standard we have come to expect from Program Power. However, you must prepare yourself for the pictures of the terrible alien creatures, such as Wilfred.

This game takes a lot of getting used to, but it's worth the trouble. Possibly not very original, I think new ideas are getting few and far between. Still, I'm not trying to put anyone off. D.B.

instructions	90%
playability	85%
graphics	90%
value for money	95%



3-D Stalkers TI-99/4A £5

Stainless, 10 Alstone Rd, Stockport, Cheshire

An interesting tactical game which requires two players. You are both trapped in a symmetrical maze from which only one of you may escape. The object is to pursue and kill your opponent before he finds and eliminates you.

The screen shows an overhead view of the maze and 3D perspectives of what is directly ahead of each player, updated after each move. Your position in the maze is not shown, but may be displayed at any time if requested. Obviously this option should not be used arbitrarily. Confirmation of your whereabouts is not only critical to you, but of certain interest to your opponent.

The length and difficulty of each game is determined by the number of shots that are required to kill your opponent, requested before each game starts. Movement, controlled by keyboard or joystick, is forward, or turn back, left or right.

Not the sort of game I find particularly addictive, but at least it does make a change to pitch your wits against an equally fallable human opponent \$ and who knows, will you be the hunter or the hunted? J.W.

instructions	90%
playability	60%
graphics	50%
value for money	85%



Raging River/ Super Jackpot TI-99/4A £6

Pete Williams, from Stainless, 10
Alstone Rd, Stockport, Cheshire

The first is actually called The Raging Amazon, and one wonders why the author gave it two titles. It is of the ski-run type: you must glide your canoe through a vertically-moving

panorama. Graphics are very good, and good use has been made of colour. Hazards include fallen trees lying half-submerged, rocks and man-eating alligators (who also have a penchant for canoes it seems). You can speed up or slow down the movement by controlling the rate at which the panorama moves past you. There are occasionally delays while a melody is played — at the beginning and whenever you fall

foul of a hazard. The cassette label claims that you should aim to travel 82 miles — it can be done, it says — but I found that frequently the river was blocked completely by more than one hazard and it was quite an effort to travel just a few miles. The second is yet another in the fruit machine mould and, although the graphics are excellent and every effort has been made to overcome the slowness of TI BASIC, in the end it is just as

boring as all the others on the market. P.B.

instructions	80%
playability	75%
graphics	90%
value for money	65%

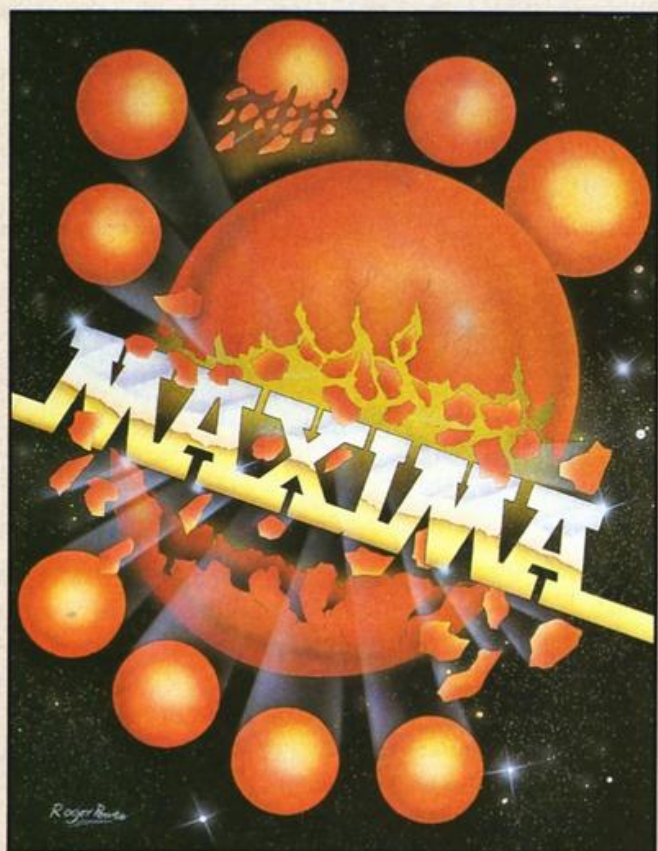


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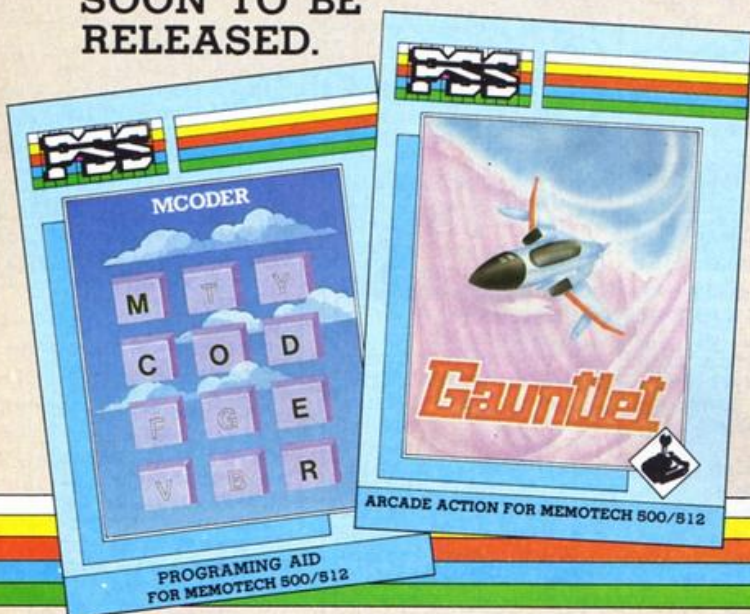
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The game opens with your ship executing an impressive jump through hyper-space to where the action is. First up are the green snappers - easy targets against the starry backdrop. Next comes the blue meanies, a swirling bunch of wriggling invaders. To follow, a crescent of rather beautiful revolving hexagonal barrels who arc around the screen raining bombs on you. Its a shame to pot these lovely creatures. On you go to a further 13 screens of magnificent graphics.

Devastatingly simple in concept it nevertheless has that indefinable ability to compel you to have just one more attempt to try and see what the 16 screens hold in store.

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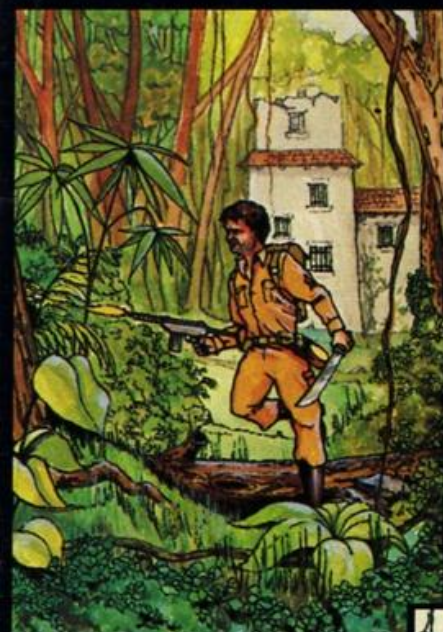
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ing." Personal Computer
News, Dec22-Jan 4 1984.
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EDUCATIONAL SOFTWARE REVIEWS

Active Computer Learning 48K Spectrum £7.95

ACL Division, Express Marketing, 73 Watery Lane, Bordesley, Birmingham

A program with a difference. It's interactive and sets out to teach you about the computer, its uses and its future, with tests at the end of each of 11 sections. At the back of the manual is a course test record sheet for the codes and scores that appear at the end of the exercises to send off to ACL. A certificate will be sent, framed if £4.99 is enclosed!

Will this program be more successful than a book? I feel it could have made better use of the graphics and sound facilities that a 48K Spectrum offers, and not

relied upon putting information across by using masses of words printed on screen using ordinary Sinclair type.

With the many aids now available to programmers larger type, fewer words and more diagrams are possible. The offered game of Space Invaders gives no chance for a second go, and answers are not put into blanks in exercises.

And why must programmers imagine that educational programs need correct answers entered before the next question can be asked? I liked the basic idea and use of the space bar to move to the next screen. T.W.

instructions	80%
playability	75%
graphics	50%
value for money	60%



Lasermaths 32K BBC £7.50

LVL, Electron House, Bridge St, Sandiacre, Nottingham

Alien spacecraft are invading your planet against your defence of three laser weapons. The lasers can only be charged by answering mathematical

problems correctly. Ten consecutive correct answers charge a laser sufficiently to enable an alien craft to be destroyed. Get one wrong, or take too long to answer, and you lose a laser.

The Mode 7 Teletext display is neat and well presented, but I think the battle scene could be a little more imaginative. The use of sound as the laser is charging

How much will they learn?

Our team of examiners marks the report cards of new software designed to teach

would also add a little more excitement for the six to 16 year old to whom the program is aimed.

The options make this an extremely versatile program. There are 56 selectable grades with various combinations of addition, subtraction, multiplication and division. Positive and negative numbers, the time allowed for answers, the largest number to be dealt with and the number of parts in the questions

can also be selected. Difficulty level can be constant or increasing.

Instructions are excellent. For kids who have to suffer computer maths there should at least be some enjoyment in this approach. D.H.

instructions	90%
playability	85%
graphics	75%
value for money	80%



Geography Dragon 32 £8.75

Cable, PSL Marketing, 52 Limbury Rd, Luton LU3 2PL

This an educational program according to its producers and the subject is Geography. I would beg to differ. This is a database program with a few features which enable questions to be asked based on its contents.

One of the well publicised features is the high resolution World Map which is quite nicely done but contains no real detail in terms of country boundaries and only very large features are labelled. There are other maps, but all are in low resolution and this leads to considerable distortion of detail. The question are all multiple choice and, as is usual with computer control of

this type of question, some of the alternatives can be ridiculous. There is also the facility to check the currency and capital of each country in the database but the search is frustratingly slow.

The only feature I can fully recommend is the spelling check which means slight misspellings can be used and the information still found. However, to call this package Geography is like calling Genesis the Bible. It's a start but by no means worthy of the name. D.C.

instructions	50%
ease of use	80%
graphics	65%
value for money	40%



Money Spectrum 48K £6.95

Stell, 36 Limefield Av, Whalley, Lancs BB6 9RJ

A program designed to introduce young children to coins, various combinations of coins, notes, change and so on. It's rather unfortunate the government has decided to ditch the 1/2p coin, because that's where the program starts.

All the coins are represented graphically, and someone has worked very hard to create near likenesses. But they are only near likenesses and not replicas. Whether a child will relate the screen picture to the real thing remains to be seen.

It's unlikely an unaided child would be able to read the screen

and manipulate the numbers involved in changing two fivers for a 10, or four fives for 20, let alone calculating change. As a result Mum or Dad should be standing by. This being so, they could do this with real money which would be a much better experience for the child.

To be fair, the designers have tried to make the program as simple as they can, but then, money's complicated stuff! Buy this program if you have no idea how to teach your child and some help, but do the teaching with the real thing, and lots of discussion. D.M.

instructions	90%
playability	90%
graphics	80%
value for money	60%



Wordgame 32K BBC £5.45

Scientific, Old Loom House, Back Church Lane, London E1 1LS

A lot of work has gone into this. A special Character set has been designed to give better formed letters with proper ascenders and descenders. The instructions are good; controls simple and fairly

easy to use. Unfortunately, the result is a rather slow and laborious exercise.

There are four stages of question, each with five difficulty levels — though this I gathered from the printed instructions, not the program. In the first two you choose letters from those displayed to fill gaps; in the other two, you key in letters to make up a word. It has a 1,000-word vocabulary.

However sometimes the choice throws up stupid questions — e.g. choose the missing letter in m*p from a or o. It could be either! This happened enough times to become annoying. At one stage the word was "opp*sition" and there was only one letter offered. Then at stage three, it gives you one letter of a three-letter word and you guess the rest. Try "e**", with only four mistakes allowed. The

answer was "eye". That sort of question can be bi**dy difficult! B.J.

instructions	80%
ease of use	50%
display	80%
value for money	70%



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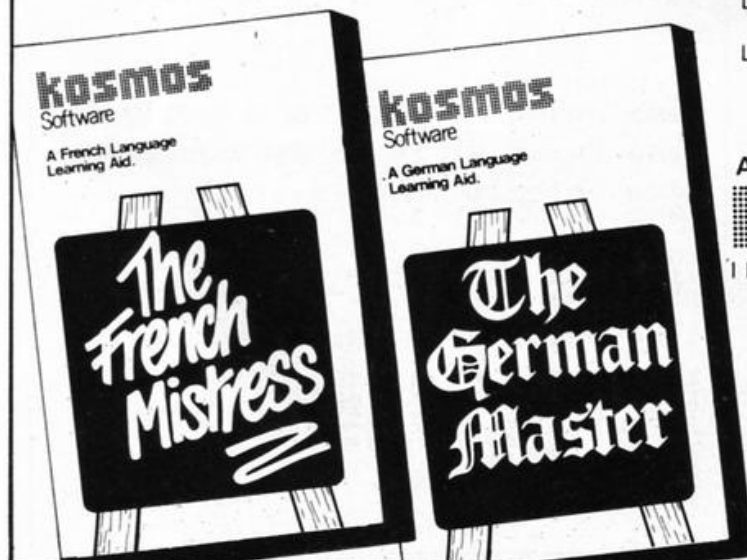
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The characters in reverse field are:

```
710 1 2 3 4 5 6 7
760 DUMMY YOU SCORED
    NIL
765 YOU NEED SOME
    PRACTICE
770 NOT BAD NOT BAD
775 VERY GOOD VERY
    GOOD
780 EXCELLENT EXCEL-
    LENT
785 CLEVER DICK CLEVER
    DICK
1030 1 2 3 4 5 6 7
1060 3 0 5 0 5 0 3
```

```
1 REM 4
30 GOTO 1000
100 PRINT AT Y,X;" "
105 LET Y=Y+1
110 PRINT AT Y,X;"0"
115 RETURN
130 PRINT AT Y,X;" "
135 RETURN
290 LET X=2
295 RETURN
300 LET X=4
305 RETURN
310 LET X=6
315 RETURN
320 LET X=8
325 RETURN
330 LET X=10
335 RETURN
```

How it works
100-139 prints a rubout routine for the falling coin
290-359 allows for players' choice of which slot to use and prints it
560-689 randomly selects next position of falling coin
700 determines score
760-785 comments on your final score
799 alters top score if necessary
810-840 routine for another game
1000-1120 prints the slot machine

Variables

S the player's score
M the 16p score held in address 16514, which is POKEd with the new top score if necessary

```
340 LET X=12
345 RETURN
350 LET X=14
355 RETURN
451 LET S=0
452 FOR J=1 TO 10
460 PRINT AT 1,2;"CHOOSE A SLOT"
500 LET Y=4
505 LET A=CODE INKEY$
507 IF A<29 OR A>35 THEN GOTO 5
509 PRINT AT 1,2;" "
510 PRINT AT 5,17;"COINS LEFT="
515 J=J-1
518 GOSUB A*10
520 PRINT AT 3,X;"0"
530 PRINT AT 3,X;" ";AT 4,X;"0"
550 GOSUB 100
555 GOSUB 130
560 FOR I=1 TO 6
570 LET Z=RND
580 IF Z>.5 AND X<14 THEN GOTO 610
585 IF Z<.5 AND X<3 THEN GOTO 6
590 LET X=X-(X>2)
600 GOTO 620
610 LET X=X+1
620 LET Y=Y+1
630 PRINT AT Y,X;"0"
640 GOSUB 100
650 GOSUB 130
660 NEXT I
690 PRINT AT Y+1,X;"0"
692 FOR I=1 TO 60
693 NEXT I
695 PRINT AT Y+1,X;" "
700 LET S=S+(3*(X=2))+ (3*(X=14))
705 PRINT AT 10,19;"SCORE=";S
710 PRINT AT 3,2;"1 2 3 4 5 6 7"
750 NEXT J
760 IF S=0 THEN PRINT AT 19,19;"DUMMY YOU";AT 21,19;"SCORED NIL"
765 IF S>0 AND S<10 THEN PRINT AT 19,19;"YOU NEED SOME";AT 21,21;"PRACTICE"
770 IF S>10 AND S<20 THEN PRINT AT 19,20;"NOT BAD";AT 21,20;"NOT BAD"
775 IF S>20 AND S<40 THEN PRINT
```

```
T AT 19,18;"VERY GOOD";AT 21,18;"VERY GOOD"
780 IF S>40 AND S<50 THEN PRINT AT 19,19;"EXCELLENT";AT 21,19;"EXCELLENT"
785 IF S=50 THEN PRINT AT 19,19;"CLEVER DICK";AT 21,19;"CLEVER DICK"
799 IF S>M THEN POKE 16514,S
800 FOR I=1 TO 200
805 NEXT I
810 PRINT AT 19,17;"ANOTHER GAME?";AT 21,17;"(Y OR N)"
820 LET A=CODE INKEY$
830 IF A=51 OR A=62 THEN GOTO 840
835 GOTO 820
840 IF A=51 THEN STOP
850 CLS
1000 FOR I=3 TO 19
1010 PRINT AT I,1;" ";AT I,15;" "
1020 NEXT I
1025 PRINT AT 4,1;" ";AT 4,15;" "
1030 PRINT AT 3,2;"1 2 3 4 5 6 7"
1040 PRINT AT 17,3;" ";
```

```
1050 PRINT AT 18,3;" ";AT 18,15;" "
1060 PRINT AT 19,2;"1 2 3 4 5 6 7"
1070 FOR I=6 TO 14 STEP 4
1080 PRINT AT I,2;"I I I I I I I I"
1090 NEXT I
1100 FOR I=8 TO 16 STEP 4
1110 PRINT AT I,3;"I I I I I I I I"
1120 NEXT I
1130 PRINT AT 5,17;"COINS LEFT=";J
1140 PRINT AT 10,19;"SCORE=";S
1150 LET M=PEEK 16514
1160 PRINT AT 14,18;"TOP SCORE T O";AT 16,20;"DATE=";M
1199 GOTO 450
1200 SAVE "SLOT"
1205 RUN
```


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Visions

DEMOLATOR

Following the Thousand year war with the Alien Demolators the last remnants of the human race are being transported across the galaxy in cryogenic suspension aboard the B.S. Quinn (Battle Star).

The Demolators however have invaded the cargo bay and it is your job to destroy the Demolators and to protect the human cargo. All you have to defend Humanity with is Xeno

(popularly named "the Phobe") the ultimate Robot. You can control his movements on two planes and fire an ultrasonic Cannon to defend humanity with.

EXCLUSIVELY AVAILABLE FROM LARGER BRANCHES OF



DEMOLATOR — BBC — MODEL 'B' OS1-2, £6.95

(FOR A LIMITED PERIOD)

Super Darts by Mike Stranger

My 12-year old son Ian and I have produced an electronic version of darts for the 16K Spectrum. It was our first real attempt to make a program, but, if Ian's reaction and that of his friends is anything to go by, then you can take it that it's super entertainment.

It's a game for one or two players, and the starting score is a matter for the players to specify. The normal rules of darts apply, and the darts are supplied (electronically, of course) in sets of three.

To aim each dart, there is a small aiming circle at the top right-hand corner of the screen. A flashing dot can be moved by the cursor keys to the point where the player wants the dart to be aimed at.

When ready to "throw", you press zero, and a dart appears on the full-screen board, which is marked in the usual manner.

But, as nobody is a perfect darts thrower, there is no guarantee that the dart will hit the board exactly where you aimed it. How like real darts!

The score achieved by each dart is confirmed by the scoreboard, with appropriate accompanying beeps, and the total remaining reduced accordingly.

For two players, separate scoreboards are displayed to the left and right of the main board. As you would expect, anyone scoring the magic 180 with a set of three darts is rewarded by a suitably triumphant sequence of beeps!

How it works

9851-9859 set up menu
9860-9865 routine for dealing
with LEFT\$
9866-9892 routine for dealing
with RIGHT\$
9893-9906 routine for dealing
with MIDS
9907 exit and return to main
listing

The rules of darts specify that, to finish, a player has to reach a zero total exactly, the final throw being either a double or a bull.

Super Darts is no exception — and the scoreboard will even tell you which double you need. If you go bust (exceed the required score to reach zero, or fail to do so with a double, then the scores achieved by all the darts in that set of three will be ignored.

How does it work? The central concept is that of the aiming circle. The position of the flashing dot relative to the

Play darts, programs a after your

Listing 1 — Super Darts

```

10 BORDER 0: PAPER 0: INK 7: CLS
20 GO SUB 1500
25 GO SUB 1110
30 PAUSE 100
40 PRINT OVER 1: INK 1: AT 7,0:
45 FOR z=1 TO 10: BEEP .02,z: BEEP .02,-z: NEXT z
50 PRINT OVER 1: INK 5: AT 12,0:
55 FOR z=1 TO 10: BEEP .02,z: BEEP .02,-z: NEXT z
60 PAUSE 100
65 FOR z=170 TO 181: PRINT AT z+1,0:
65 "D D D D D D D D D D D D D D D D" AT z+1,0: "A A A A A A A A A A A A A A A A"
AT z+2,0: "R R R R R R R R R R R R R R R R": BEEP .01,20-z: NEXT z
70 PRINT AT 21,0: INVERSE 1: PAPER 7: INK 1: IAN AND MIKE STANGER
1 BEEP .2,-15: PAUSE 51: BEEP 1,-15
80 INK 7: PAUSE 50: CLS
90 PRINT "HOW TO PLAY SUPER DARTS" "The game follows the basic rules of darts.
Use the cursor keys to position the flashing dot inside the aiming circle. When y
our firehate dart will appear on the mainboard roughly where you aimed it" "Well,
no-one is perfect!"
95 PRINT "Your aim is to reduce your score to 0 from its initial value -": INF
U "INITIAL SCORE 1: PRINT: FLASH 1: PAUSE 100
100 PRINT "Don't forget to finish with a Double or a Bull."
110 PAUSE 20: PRINT: FLASH 1: "Press any key to start"
120 PAUSE 0
150 DIM T(2)
160 BORDER 0: PAPER 0: INK 6: CLS
170 GO SUB 1110
180 INK 5
190 INK 5
200 GO SUB 1200
210 INK 4: PAUSE 100
220 INPUT "One or two players? 1/2 "i0: IF 0>2 OR 0<1 THEN GO TO 220
250 LET T(1)=1: PRINT: FLASH 1: INK 7: AT 8,0: "P1": FLASH 0: AT 12,0: INK 7: T(1)
255 IF 0=1 THEN GO TO 270
260 LET T(2)=1: PRINT: INK 7: AT 8,20: "P2": AT 12,20: INK 7: T(2)
270 LET P=1
300 FOR k=3 TO 1 STEP -1
310 INK 4: LET s1=0: LET s2=0: LET s3=0
315 IF P=1 THEN LET h=0
316 IF P=2 THEN LET h=20
320 CIRCLE 250,150,25
330 PLOT 250,150
335 PRINT AT 0,0: "Use cursor" AT 1,0: "keys to" AT 2,0: "set up" AT 3,0: "aim"
340 PLOT 5,5: DRAW 29,0: DRAW 0,29: DRAW -29,0: DRAW 0,-29
341 PRINT AT 18,1: "DDD" AT 19,1: "AAA" AT 20,1: "RRR"
345 FOR k=3 TO 1 STEP -1
350 LET x=230: LET y=155
370 PLOT OVER 150: PLOT x,y
380 PRINT OVER 150: AT 18,7: "When" AT 19,26: "ready" AT 20,25: "press 0" AT 21,24:
to throw"
390 PLOT OVER 1: x,y
395 IF INKEY#="0" THEN GO TO 450
396 LET x=x-(INKEY#="5" AND x>207)+(INKEY#="8" AND x<254)
398 LET y=y-(INKEY#="6" AND y>126)+(INKEY#="7" AND y<174)
400 PAUSE 50
410 GO TO 370
450 PRINT AT 18,k: "i" AT 19,k: "j" AT 20,k: " "
460 LET v=INT (RND*25)
530 LET X=127+3*(x-230)
540 LET Y=87+3*(y-150)
550 IF INT (RND*2)>0 THEN LET X=X+v
560 IF INT (RND*2)=1 THEN LET X=X-v
570 IF INT (RND*2)>0 THEN LET Y=Y+v
580 IF INT (RND*2)=1 THEN LET Y=Y-v
590 IF Y>170 THEN LET Y=170
591 IF Y<5 THEN LET Y=5
592 IF X>220 THEN LET X=220
593 IF X<30 THEN LET X=30
600 PLOT X-5,y: DRAW 10,0: PLOT X,Y-5: DRAW 0,10: CIRCLE X,Y,5
610 FOR k=1 TO 10: BEEP .01,k: NEXT k
700 LET D=SOR (ABS (X-127)+2*ABS (Y-87))/2
705 IF D<1 THEN LET C=0: GO TO 720
710 LET C=(X-127)/D
720 IF (Y-87)>0 THEN LET A=ACS C
730 IF (Y-87)<0 THEN LET A=PI-ACS C
740 IF A>=0 AND A<PI/20 THEN LET s=0
750 IF A>=PI/20 AND A<3*PI/20 THEN LET s=1
765 IF A>=3*PI/20 AND A<5*PI/20 THEN LET s=4
770 IF A>=5*PI/20 AND A<7*PI/20 THEN LET s=10
775 IF A>=7*PI/20 AND A<9*PI/20 THEN LET s=1
780 IF A>=9*PI/20 AND A<11*PI/20 THEN LET s=20
785 IF A>=11*PI/20 AND A<13*PI/20 THEN LET s=5
790 IF A>=13*PI/20 AND A<15*PI/20 THEN LET s=12
795 IF A>=15*PI/20 AND A<17*PI/20 THEN LET s=9
800 IF A>=17*PI/20 AND A<19*PI/20 THEN LET s=14
805 IF A>=19*PI/20 AND A<21*PI/20 THEN LET s=11
810 IF A>=21*PI/20 AND A<23*PI/20 THEN LET s=8
815 IF A>=23*PI/20 AND A<25*PI/20 THEN LET s=16
820 IF A>=25*PI/20 AND A<27*PI/20 THEN LET s=7
825 IF A>=27*PI/20 AND A<29*PI/20 THEN LET s=19
830 IF A>=29*PI/20 AND A<31*PI/20 THEN LET s=3
835 IF A>=31*PI/20 AND A<33*PI/20 THEN LET s=17
840 IF A>=33*PI/20 AND A<35*PI/20 THEN LET s=2
845 IF A>=35*PI/20 AND A<37*PI/20 THEN LET s=15

```

How it works

1010 validates entered run data, sets v\$ to indicate validity or otherwise

1120 inserts automatic transactions

1500 adds a transaction

1800 converts numeric account to zero-filled right-aligned string

1900 receives main menu responses and transfers control to relevant routine

2100 adds a new account
2450 deletes an account
2840 receives account menu

responses, transfers control to relevant routine

3100 adds a regular transaction
3700 deletes a regular transaction

4150 prints enquiry on regular transaction

4500 receives data for new transaction, stores it temporarily in b\$ and calls 1500 to add it to database

5000 deletes a transaction

5500 prints enquiry on all accounts

6000 prints enquiry on transactions starting from an entered date for an account

6100 prints enquiry on all transactions held for an account
7000 quite program, option to save and verify

9000 validates entered amount, reformats it for printing and data storage, sets v\$ to

9996 prints blanks on error line
9998 prints error message on

error line

centre of the circle is first of all multiplied by a factor of three.

Before applying this to the full-screen board, a random variation is added to the calculations at this stage (nobody's a perfect darts player!) Then the dart is printed on the main board as a cross enclosed in circle (end-view, of course).

The position of the dart relative to the centre of the main board is now re-defined in terms of its distance from the centre and the angle from the

convert and look money

Here's something for every
Spectrum owner: a great darts
game, help on converting
programs from other
computers and a household
accounts program

```

850 IF A>37*PI/20 AND A<39*PI/20 THEN LET s=10
855 IF A>39*PI/20 AND A<41*PI/20 THEN LET s=6
860 IF D<16 AND D>8 THEN LET s=25: FOR z=1 TO 5: BEEP .01,30: NEXT z
865 IF D<9 THEN LET s=50: FOR z=1 TO 10: BEEP .01,30: NEXT z
866 IF T(P)=50 AND s=50 THEN BEEP 3,50: INK 2
868 IF D>79 THEN LET s=0: BEEP 2,-40
869 PRINT AT 10,h: " "
870 PRINT AT 10,h: INK 3: FOR z=1 TO 10: BEEP .005,50: NEXT z
880 IF D<79 AND D>70 THEN LET s=s*2: PRINT AT 10,h+2: INK 3: FLASH 1;"D": FOR
z=1 TO 10: BEEP .005,50: NEXT z
890 IF D<51 AND D>42 THEN LET s=s*3: PRINT AT 10,h+2: INK 3: FLASH 1;"T": FOR
n=1 TO 2: FOR z=1 TO 10: BEEP .005,50: NEXT z: PAUSE 5: NEXT n
895 IF k=3 THEN LET s=s
896 IF k=2 THEN LET s=s
897 IF k=1 THEN LET s=s
898 IF s=T(P) AND D<8 THEN GO TO 905
899 IF s=T(P) AND D>70 THEN GO TO 905
900 IF s>T(P) THEN LET T(P)=T(P)-s: LET T(P)=T(P)+(s+2*s*3): BEEP 1,-20: BEE
P 2,-40: GO TO 955
905 PRINT AT 12,h: " "
910 LET T(P)=T(P)-s
912 IF T(P)=0 THEN GO TO 1050
915 IF T(P)>40 THEN GO TO 925
920 IF T(P)/2-INT(T(P)/2)=0 THEN PRINT AT 12,h: INK 7: T(P)/2: FLASH 1;"x2":
GO TO 940
930 PRINT AT 12,h: INK 7: T(P)
940 NEXT k
950 IF s1+s2+s3=100 THEN FOR z=1 TO 20: BEEP .05,(INT(RND*20)): NEXT z
955 CLS : INK 7
960 IF T(P)>40 THEN GO TO 970
965 IF T(P)/2-INT(T(P)/2)=0 THEN PRINT AT 8,h: "P": P: AT 12,h: T(P)/2: "x2": GO
TO 975
970 PRINT AT 8,h: "P": P: AT 12,h: T(P)
975 IF D=1 THEN GO TO 1040
980 IF P=1 THEN LET P=2: GO TO 1000
990 IF P=2 THEN LET P=1
995 IF P=1 THEN LET h=0
1000 IF P=2 THEN LET h=20
1010 IF T(P)>40 THEN GO TO 1030
1020 IF T(P)/2-INT(T(P)/2)=0 THEN PRINT : FLASH 1: AT 8,h: "P": P: AT 12,h: T(P)/
2: "x2": GO TO 1040
1030 PRINT : FLASH 1: AT 8,h: "P": P: AT 12,h: T(P)
1040 INK 6: GO SUB 1100: INK 5: GO SUB 1200: GO TO 300
1050 PRINT : PAPER 2: INK 7: AT 9,10: " " : AT 10,10: "P": P: WINS- "A
T 11,10: "WELL DONE": AT 12,10: " "
1060 FOR g=1 TO 3
1070 FOR z=50 TO 50 STEP 2: BEEP .005,z: BEEP .005,-z: NEXT z
1080 NEXT g
1090 INPUT "Another game? Y/N "IG
1095 IF IG="Y" OR IG="y" THEN GO TO 150
1100 BORDER 0: PAPER 0: CLS : PAUSE 0
1105 GO TO 2000
1110 CIRCLE 127,87,79: BEEP .01,5
1120 CIRCLE 127,87,78: BEEP .01,10
1130 CIRCLE 127,87,70: BEEP .01,10
1140 CIRCLE 127,87,50: BEEP .01,15
1150 CIRCLE 127,87,42: BEEP .01,20
1160 CIRCLE 127,87,15: BEEP .01,25
1170 CIRCLE 127,87,0: BEEP .01,30
1180 PLOT 49,74: DRAW 156,22: PLOT 49,98: DRAW 156,-22
1190 PLOT 55,55: DRAW 144,64: PLOT 55,119: DRAW 144,-64
1192 PLOT 67,34: DRAW 120,106: PLOT 67,140: DRAW 120,-106
1193 PLOT 91,20: DRAW 74,134: PLOT 91,154: DRAW 74,-134
1194 PLOT 114,10: DRAW 26,154: PLOT 114,164: DRAW 26,-154
1195 BEEP .2,29
1196 RETURN
1200 PRINT AT 0,15: "20": AT 0,19: "1": AT 2,22: "18": AT 5,25: "4": AT 7,26: "13": AT 10,
26: "6"
1210 PRINT AT 13,26: "10": AT 16,25: "15": AT 19,22: "2": AT 21,10: "17": AT 21,15: "3"
1220 PRINT AT 21,11: "19": AT 19,9: "7": AT 16,5: "16": AT 13,5: "8"
1230 PRINT AT 10,4: "11": AT 7,4: "14": AT 5,6: "9": AT 2,8: "12": AT 0,12: "5"
1240 RETURN
1500 FOR z=0 TO 7: READ a: POKE USR "d"+z, a: NEXT z
1501 FOR z=0 TO 7: READ a: POKE USR "a"+z, a: NEXT z
1502 FOR z=0 TO 7: READ a: POKE USR "r"+z, a: NEXT z
1510 RETURN
1600 DATA 40,124,124,124,124,56,56,16,16,16,16,16,16,16,16,56,56,56,56,56,16,
16,16
2000 SAVE "Darts" LINE 1

```

three o'clock position.

The angle enables the computer to decide in which scoring segment the dart is situated, and the distance enables it to decide whether it's a double, treble, outer or bull (or a miss, for that matter!)

Note: Capitals in PRINT statements should be entered in GRAPHICS mode.

Converting BASIC by R.A. Houlton

Sinclair BASIC uses a non-standard form of string slicing, as those who try to convert programs written for other computers know only too well.

This program takes the sweat, toil and tears out of conversion by allowing you to enter the form used in ordinary Microsoft BASIC and

Main Variables

t\$(9,50,43) holds transactions for all accounts. Each element consists of: date six characters, debit/credit one character, reference six characters, comment 15 characters, amount seven characters, balance seven characters, debit/credit (bal) one character. The first dimension is the account number and the second is the transaction number within the account

a\$(9,198) holds account information. Each element consists of: account name 15 characters, number of regular transactions one character (0-9), number of transactions two characters (00-49), regular transaction block 180 characters (9 x 20). Each element consists of: day of month two characters, comment 10 characters, amount seven characters, debit/credit one character. The first dimension is account number

d\$(6) current date

p\$(6) date of previous update

q\$(6) work date — used in regular transaction processing

v\$(1) used as a validation result indicator and to hold menu responses

w\$(7) work field

b\$(35) used to hold a transaction temporarily

accts number of accounts

m(12) number of days in each month

i,j,k,l, subscripts

w,x,y work fields

supplying you with the Sinclair equivalent.

The program allows you to input both numeric and alphabetic values for the variables associated with LEFT\$, RIGHT\$, and MID\$ in any combination. The line numbering may at first seem peculiar, but in fact serves two purposes:

- It tucks the program into an area of line numbers which are not often used in programs and thus allows you to call on the routine while typing your main program by using the direct command GOTO 9851.

- For those who used my previous Dragon conversion it can be combined with that program by using the Spectrum's MERGE command.

The variables used have been kept to a minimum, Z, Z\$, I, I\$, J and JS, and are only used as local input variables. This means that you can use these variables in your main program.

The program may be left as

part of the main program if there is no shortage of memory. It may be worthwhile adding line 9850 STOP as a precaution against the utility program becoming used in the main program.

If it is essential to remove lines 9851 to 9907 then an easy way to do it is to SAVE the conversion program, then prepare a dummy program consisting of the line numbers 9851 to 9907 each followed by a REM statement; SAVE this on the same tape and following the conversion program.

When you wish to remove the conversion program MERGE the dummy program which will overwrite the existing program. Enter LIST 9851 and push the BREAK key. Now, keeping the CAPS/SHIFT key depressed, press keys 1, 8, 0, ENTER in sequence and repeat until all lines have been removed. This way you do not have to think about which line number to enter next.

The program is, of course, specific to the Spectrum, but for those owners of other makes of computer who may wish to use the idea to operate in reverse the following information may be useful:

Sinclair Basic	Microsoft Basic
X\$(1 TO A)	
OR	
X\$(TO A)	LEFT\$(X\$,A)
X\$(A TO B)	MID\$(X\$,A,(B
	+ 1) - A))
X\$(A TO)	RIGHT\$(
	X\$,(LEN X\$
	+ 1) - A))

Accounts by Geoff Griffiths

My program will sort out your money for you. It will handle bank and investment accounts or particular categories of income and expenditure. And it can cater for up to nine accounts, each holding up to 50 transactions.

Up to nine monthly transactions — like standing orders — can be dealt with per account.

You enter a date of the

Listing 2 — String Slicing: Converting Microsoft BASIC to Sinclair BASIC

```

9851 REM ***STRING SLICING*** CONVERTING MICROSOFT BASIC TO SINCLAIR BASIC
9852 REM 1984 BY R.A.HOULTON
9853 PRINT TAB 9;"STRING SLICING"; PRINT TAB 9;"*****"
9854 PRINT : PRINT TAB 2;"WHICH ACTION DO YOU REQUIRE?"
9855 PRINT : PRINT TAB 0;"(1) LEFTS TAB 11; (2) RIGHTS TAB 23; (3) MID$ "
9856 PRINT : PRINT "SELECT BY NUMBER, PRESS <ENTER>"; INPUT Z
9857 IF Z=1 THEN GO TO 9860
9858 IF Z=2 THEN GO TO 9866
9859 IF Z=3 THEN GO TO 9893
9860 PRINT : PRINT "LEFTS HAS THE FORM LEFT$(X$,I)"; PRINT : PRINT "PLEASE ENTER
VALUE OF I"; INPUT "LEFT$(X$,I)"; I$
9861 PRINT : PRINT TAB 0;"FOR LEFT$(X$,I)"; USE X$(1 TO I$);
9862 PRINT : PRINT "FOR ANOTHER LEFT$ ENTER 1"; PRINT "FOR RIGHTS OR MID$ ENTER
2"; PRINT "FOR RETURN TO LIST ENTER 3"; INPUT Z
9863 IF Z=1 THEN CLS : GO TO 9860
9864 IF Z=2 THEN CLS : GO TO 9861
9865 IF Z=3 THEN GO TO 9907
9866 PRINT : PRINT "RIGHTS HAS THE FORM RIGHT$(X$,I)"; PRINT : PRINT "IS YOUR I
A NUMBER OR A LETTER?"; INPUT "N FOR NUMBER, L FOR LETTER"; Z$
9867 IF Z$="L" OR Z$="I" THEN GO TO 9880
9868 PRINT : PRINT "PLEASE ENTER VALUE OF I"; INPUT "RIGHT$(X$,I)"; I$
9869 PRINT : PRINT "IS LENGTH OF X$ KNOWN?"; INPUT "ENTER Y FOR YES N FOR NO"; Z
$
9870 IF Z$="N" OR Z$="n" THEN GO TO 9874
9871 IF Z$="Y" OR Z$="y" THEN INPUT "ENTER LENGTH OF X$"; Z
9872 IF Z<1 THEN PRINT : PRINT "IMPOSSIBLE? LENGTH OF X$ MUST BE GREATER OR E
QUAL TO 1. PLEASE TRY AGAIN"; GO TO 9889
9873 PRINT : PRINT "FOR RIGHT$(X$,I)"; PRINT : PRINT "USE X$(Z-(I-1)) TO
I"; GO TO 9889
9874 PRINT : PRINT "IS X$ KNOWN?"; INPUT "ENTER Y FOR YES N FOR NO"; Z$
9875 IF Z$="N" OR Z$="n" THEN GO TO 9879
9876 IF Z$="Y" OR Z$="y" THEN INPUT "PLEASE ENTER X$"; Z$; LET Z=LEN Z$
9877 IF LEN Z$<1 THEN PRINT : PRINT "IMPOSSIBLE? LENGTH OF X$ MUST BE GREATER
OR EQUAL TO 1. PLEASE TRY AGAIN"; GO TO 9889
9878 PRINT : PRINT "FOR RIGHT$(X$,I)"; PRINT : PRINT "USE X$(Z-(I-1)) TO
I"; GO TO 9889
9879 PRINT : PRINT "FOR RIGHT$(X$,I)"; PRINT : PRINT "USE X$(LEN X$)-(I-1)
TO I"; GO TO 9889
9880 PRINT : PRINT "PLEASE ENTER I"; INPUT "RIGHT$(I)"; I$
9881 PRINT : PRINT "IS LENGTH OF X$ KNOWN?"; INPUT "ENTER Y FOR YES N FOR NO"; Z
$
9882 IF Z$="N" OR Z$="n" THEN GO TO 9885
9883 IF Z$="Y" OR Z$="y" THEN INPUT "ENTER LENGTH OF X$"; Z
9884 PRINT : PRINT "FOR RIGHT$(X$,I)"; PRINT : PRINT "USE X$(Z-(I-1)) TO
I"; GO TO 9889
9885 PRINT : PRINT "IS X$ KNOWN?"; INPUT "ENTER Y FOR YES N FOR NO"; Z$
9886 IF Z$="N" OR Z$="n" THEN GO TO 9888
9887 IF Z$="Y" OR Z$="y" THEN INPUT "PLEASE ENTER X$"; Z$; LET Z=LEN Z$; GO TO 9
884
9888 PRINT : PRINT "FOR RIGHT$(X$,I)"; PRINT : PRINT "USE X$(LEN X$)-(I-1)
TO I"; GO TO 9889
9889 PRINT : PRINT "FOR ANOTHER RIGHT$ ENTER 1"; PRINT "FOR LEFT$ OR MID$ ENTER
2"; PRINT "FOR RETURN TO LIST ENTER 3"; INPUT Z
9890 IF Z=1 THEN CLS : GO TO 9860
9891 IF Z=2 THEN CLS : GO TO 9861
9892 IF Z=3 THEN GO TO 9907
9893 PRINT : PRINT "MID$ HAS THE FORM MID$(X$,I,J)"; PRINT : PRINT "IS YOUR I
A NUMBER OR A LETTER?"; INPUT "N FOR NUMBER, L FOR LETTER"; Z$; IF Z$="L" OR Z$="I"
THEN GO TO 9907
9894 PRINT : PRINT "PLEASE ENTER VALUE OF I"; INPUT "MID$(X$,I)"; I$; PRINT : PRINT
"IS YOUR J A NUMBER OR A LETTER?"; INPUT "N FOR NUMBER L FOR LETTER"; Z$; IF Z$="L"
OR Z$="I" THEN GO TO 9900
9895 PRINT : PRINT "PLEASE ENTER VALUE OF J"; INPUT "MID$(X$,I,J)"; J$
9896 PRINT : PRINT "FOR MID$(X$,I,J)"; PRINT : PRINT "USE X$(I) TO
I+J-1"; GO TO 9900
9897 PRINT : PRINT "PLEASE ENTER VALUE OF I"; INPUT "MID$(X$,I)"; I$; PRINT : PRINT
"IS YOUR J A NUMBER OR A LETTER?"; INPUT "N FOR NUMBER L FOR LETTER"; Z$; IF Z$="L"
OR Z$="I" THEN GO TO 9902
9898 PRINT : PRINT "PLEASE ENTER VALUE OF J"; INPUT "MID$(X$,I,J)"; J$
9899 PRINT : PRINT "FOR MID$(X$,I,J)"; PRINT : PRINT "USE X$(I) TO
I+J-1"; GO TO 9900
9900 PRINT : PRINT "PLEASE ENTER VALUE OF J"; INPUT "MID$(X$,I,J)"; J$; PRINT : PRI
NT "FOR MID$(X$,I,J)"; PRINT : PRINT "USE X$(I) TO I+J-1"; GO TO 9900
9901 PRINT : PRINT "PLEASE ENTER VALUE OF J"; INPUT "MID$(X$,I,J)"; J$; PRINT : PRI
NT "FOR MID$(X$,I,J)"; PRINT : PRINT "USE X$(I) TO I+J-1"; GO TO 9900
9902 PRINT : PRINT "PLEASE ENTER VALUE OF J"; INPUT "MID$(X$,I,J)"; J$; PRINT : PRI
NT "FOR MID$(X$,I,J)"; PRINT : PRINT "USE X$(I) TO I+J-1"; GO TO 9900
9903 PRINT : PRINT "FOR ANOTHER MID$ ENTER 1"; PRINT "FOR LEFT$ OR RIGHT$ ENT
ER 2"; PRINT "FOR RETURN TO LIST ENTER 3"; INPUT Z
9904 IF Z=1 THEN CLS : GO TO 9860
9905 IF Z=2 THEN CLS : GO TO 9861
9906 IF Z=3 THEN GO TO 9907
9907 PRINT : PRINT "NOW ENTER YOUR NEXT PROGRAM LINE"; STOP

```

previous run and any regular transactions within the intervening period are automatically added to the database.

The SAVE facility caters for a cycle of three tapes (numbered 1-3) to safeguard against loss of data.

Here's a full list of all the facilities:

- Enquire on all accounts. Gives the current balance for each account and the total of all accounts
- Add an account. Consists of account name, up to 15 characters
- Delete an account
- Add a regular transaction for an account. Consists of day of the month (01-31), comment (up to 10 characters), amount (up to £99,999.99) and whether

How it works

- 100-120 title sequence and instructions
- 150-270 initialisation routines
- 300-940 main loop, including:
- 345-410 aiming circle routine
- 460-580 random variant routine
- 590-610 dart printing routine
- 700-868 score calculation for each dart
- 869-930 score display routines
- 950 beep routine for 180!
- 960-1030 test for finishing double, and change players
- 1050-1105 end-display sequence
- 1100-1240 main board graphic routines
- 1500-1600 user graphics routine and data

the transaction of a debit or credit

● Delete a regular transaction for an account

● Enquire on all regular transactions for an account.

Variables

- x,y co-ordinates of moveable pixel in aiming circle
- X,Y co-ordinates of dart on main board
- v random variant
- A angle (in radians) of dart, relative to X-axis and centre of main board
- D distance of dart from centre of main board
- s score achieved by each dart (s1, s2, s3 are scores for each individual dart in set of three)
- T(P) total of player P (1 or 2)

Gives details of all regular transactions which currently apply

- Add a transaction. Consists of reference (up to six characters, e.g. cheque number), comment (up to 15 characters, e.g. name of payee), amount (up to £99,999.99) and whether the transaction is a

debit or credit. The date is inserted by the program

- Delete a transaction
- Enquire on all transactions for an account. Both manually entered and regular transactions — inserted by the program — are displayed
- Enquire on all transactions for an account from a particular date

Listing 3 — Accounts

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1 DIM p$(6); DIM d$(6); DIM q$(6); DIM w$(7); DIM v$(1); DIM a$(9,198); DIM t
$(9,50,43); DIM b$(35); DIM m(12)
2 LET p$="000000"
3 DATA 31,20,31,30,31,30,31,31,30,31,30,31
4 FOR i=1 TO 12
5 READ m(i); NEXT i
6 LET acct$=""; LET t=3; STOP
100 CLS : PRINT AT 10,1;"PLEASE ENTER TODAY'S DATE"
102 PRINT AT 5,1;"LAST UPDATE WAS ON "p$
105 PRINT AT 12,1;"(DDMMYY)"
110 INPUT LINE d$
120 GO SUB 1010
130 IF v$="1" THEN PRINT AT 16,1;"INVALID DATE - PLEASE TRY AGAIN"; G
O TO 110
140 IF v$="1" THEN PRINT AT 16,1;"DATE TOO LOW - PLEASE TRY AGAIN"; G
O TO 110
150 IF p$<>"000000" THEN GO SUB 1120
160 GO SUB 1900
170 STOP
180 FOR i=1 TO 6
190 IF d$(i)<"0" OR d$(i)>"9" THEN GO TO 1110
200 NEXT i
210 IF VAL (d$(1 TO 2))<1 OR VAL (d$(1 TO 2))>31 THEN GO TO 1110
220 IF VAL (d$(3 TO 4))<1 OR VAL (d$(3 TO 4))>12 THEN GO TO 1110
230 IF VAL (d$(5 TO 6))<83 THEN GO TO 1110
240 IF VAL (d$(1 TO 2))<=VAL (d$(3 TO 4)) THEN GO TO 1100
250 IF d$(1 TO 4)<>"2902" THEN GO TO 1110
260 IF VAL (d$(5 TO 6))<4<INT (VAL (d$(5 TO 6))/4) THEN GO TO 1110
270 IF VAL (d$(5 TO 6))<4<=d$(1 TO 2)>p$(5 TO 6)+p$(3 TO 4)>p$(1 TO 2) THEN
LET v$="v"; RETURN
280 LET v$="1"; RETURN
290 LET p$="1"; RETURN
300 LET q$(3 TO 6)+p$(3 TO 6)
310 IF VAL (q$(5 TO 6))/4=INT (VAL (q$(5 TO 6))/4) THEN LET m(2)=29
320 FOR j=1 TO VAL (a$(1,16))
330 LET q$(1 TO 2)=a$(1,20+j-1 TO 20+j)
340 IF VAL (q$(1 TO 2))<=VAL (q$(3 TO 4)) THEN LET q$(1 TO 2)=STR$ (m(VAL (q$(
1 TO 2)))
350 IF d$(5 TO 6)<=d$(3 TO 4)>+d$(5 TO 6)>q$(5 TO 6)>q$(3 TO 4)>q$ AND q$(5 TO 6)>q$(3 T
O 4)>p$(5 TO 6)>p$(3 TO 4)>p$ THEN GO TO 1190
360 GO TO 1250
370 LET b$(1 TO 6)=q$
380 LET b$(7)=a$(1,20+j-10)
390 LET b$(8 TO 13)= " "
400 LET b$(14 TO 19)= "REG "
410 LET b$(19 TO 28)=a$(1,20+j-1 TO 20+j-10)
420 LET b$(29 TO 35)=a$(1,20+j-11 TO 20+j-17)
430 GO SUB 1500
440 NEXT j
450 NEXT i
460 LET y=VAL (q$(3 TO 4))
470 IF y<10 THEN LET q$(3 TO 4)="0"+STR$ (y); GO TO 1310
480 LET q$(3 TO 4)=STR$ (y)
490 IF y<12 THEN GO TO 1360
500 LET q$(3 TO 4)="01"
510 LET v=VAL (q$(5 TO 6))
520 LET w$="1"
530 LET w$(5 TO 6)=STR$ (w)
540 IF q$(5 TO 6)>q$(3 TO 4)<=d$(5 TO 6)>+d$(3 TO 4) THEN GO TO 1125
550 LET m(2)=20; RETURN
560 LET w=VAL (a$(1,17 TO 18))
570 IF w<50 THEN GO TO 1550
580 FOR k=1 TO 49
590 LET t$(1,k)=t$(1,k+1)
600 NEXT k; LET w=49
610 LET w=w+1
620 IF w<10 THEN LET a$(1,17 TO 18)="0"+STR$ (w); GO TO 1580
630 LET a$(1,17 TO 18)=STR$ (w)
640 LET t$(1,w TO 35)=w$
650 IF w=1 THEN LET t$(1,w,36 TO 42)=t$(1,w,29 TO 35); LET t$(1,w,43)=t$(1,w,7
); RETURN
660 LET w=VAL (t$(1,w-1,36 TO 42))
670 IF t$(1,w-1,43)="D" THEN LET w=w-1
680 LET w=VAL (t$(1,w,29 TO 35))
690 IF t$(1,w,7)="D" THEN LET w=w-1
700 LET w=w+1
710 GO SUB 1000; LET t$(1,w,36 TO 42)=w$
720 IF w<=0 THEN LET t$(1,w,43)="C"; RETURN
730 LET t$(1,w,43)="D"; RETURN
740 LET w=ABS (w)
750 LET w$="00000000"
760 LET w$<=LEN (STR$ (y)) TO 7)=STR$ (y)
770 RETURN
780 CLS : PRINT AT 0,0;"MAIN MENU"
790 PRINT AT 0,14;"DATE "d$
800 PRINT AT 2,0;"PLEASE ENTER 1 OF THE FOLLOWING"

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1930 PRINT AT 4,0;"A - ADD A NEW ACCOUNT"
1940 PRINT AT 5,0;"B - DELETE AN ACCOUNT"
1950 PRINT AT 6,0;"C - ENQUIRE ON ALL ACCOUNTS"
1960 PRINT AT 7,0;"D - QUIT"
1970 FOR i=1 TO accts
1980 PRINT AT 1+0,0;1;" - PROCESS "i$ (1, 15)
1990 NEXT i
2000 IF INKEY$="" THEN GO TO 2000
2010 LET v$=INKEY$
2020 IF v$="A" OR v$="a" THEN GO SUB 2100: GO TO 1900
2030 IF v$="B" OR v$="b" THEN GO SUB 2450: GO TO 1900
2040 IF v$="C" OR v$="c" THEN GO SUB 3500: GO TO 1900
2050 IF v$="D" OR v$="d" THEN GO SUB 7000: RETURN
2060 IF v$="Q" AND v$=STR$(accts) THEN GO SUB 2040: GO TO 1900
2070 GO TO 2000
2100 CLS : PRINT AT 0,0;"ACCOUNT ADDITION DATE "id$
2110 IF accts<9 THEN GO TO 2200
2120 PRINT AT 11,0;"ACCOUNT TABLE FULL"
2130 PRINT AT 12,0;"PLEASE ENTER 1 OF THE FOLLOWING"
2140 PRINT AT 13,0;"A - CONFIRM ADDITION"
2150 PRINT AT 14,0;"B - RE-ENTER DETAILS"
2160 IF INKEY$="" THEN GO TO 2160
2170 LET v$=INKEY$
2180 IF v$="A" OR v$="a" THEN RETURN
2190 GO TO 2160
2200 PRINT AT 7,0;"PLEASE ENTER ACCOUNT NAME"
2210 PRINT AT 8,0;"(UP TO 15 CHARACTERS)"
2220 INPUT LINE s$
2230 IF LEN(s$)=0 OR LEN(s$)>15 THEN GO SUB 9990: GO TO 2220
2240 PRINT AT 2,0;"ACCOUNT NAME "i$
2250 PRINT AT 7,0;"
2260 PRINT AT 8,0;"
2270 PRINT AT 11,0;"PLEASE ENTER 1 OF THE FOLLOWING"
2280 PRINT AT 13,0;"A - CONFIRM ADDITION"
2290 PRINT AT 14,0;"B - RE-ENTER DETAILS"
2300 PRINT AT 15,0;"R - RETURN TO MAIN MENU"
2310 GO SUB 9996
2320 IF INKEY$="" THEN GO TO 2330
2330 LET v$=INKEY$
2340 IF v$="A" OR v$="a" THEN RETURN
2350 IF v$="B" OR v$="b" THEN GO TO 2100
2360 IF v$="R" OR v$="r" THEN GO TO 2330
2370 LET accts=accts+1
2380 LET a$(accts, 15)=s$
2390 LET a$(accts, 16 TO 18)="000"
2400 RETURN
2450 CLS : PRINT AT 0,0;"ACCOUNT DELETION DATE "id$
2460 IF accts=0 THEN GO TO 2540
2470 PRINT AT 11,0;"ACCOUNT TABLE EMPTY"
2480 PRINT AT 12,0;"PLEASE ENTER --"
2490 PRINT AT 14,0;"R - RETURN TO MAIN MENU"
2500 IF INKEY$="" THEN GO TO 2500
2510 LET v$=INKEY$
2520 IF v$="R" OR v$="r" THEN RETURN
2530 GO TO 2500
2540 PRINT AT 7,0;"PLEASE ENTER ACCOUNT NUMBER"
2550 PRINT AT 8,0;"(1-15:accts)"
2560 INPUT LINE s$
2570 IF LEN(s$)>1 THEN GO TO 2600
2580 IF s$="1" OR s$=STR$(accts) THEN GO TO 2600
2590 GO TO 2610
2600 GO SUB 9998: GO TO 2560
2610 PRINT AT 2,0;"ACCOUNT NAME "i$(VAL(s$), 15)
2620 PRINT AT 7,0;"
2630 PRINT AT 8,0;"
2640 PRINT AT 11,0;"PLEASE ENTER 1 OF THE FOLLOWING"
2650 PRINT AT 13,0;"A - CONFIRM DELETION"
2660 PRINT AT 14,0;"B - RE-ENTER DETAILS"
2670 PRINT AT 15,0;"R - RETURN TO MAIN MENU"
2680 GO SUB 9996
2690 IF INKEY$="" THEN GO TO 2690
2700 LET v$=INKEY$
2710 IF v$="A" OR v$="a" THEN RETURN
2720 IF v$="B" OR v$="b" THEN GO TO 2450
2730 IF v$="R" OR v$="r" THEN GO TO 2540
2740 FOR i=VAL(s$) TO accts-1
2750 LET a$(i)=a$(i+1)
2760 NEXT i
2770 LET accts=accts-1
2780 RETURN
2840 LET i=VAL(v$)
2850 CLS : PRINT AT 0,0;"ACCOUNT MENU DATE "id$
2860 PRINT AT 2,0;a$(1, 15)
2870 PRINT AT 4,0;"PLEASE ENTER 1 OF THE FOLLOWING"
2880 PRINT AT 6,0;"A - ADD REGULAR TRANSACTION"
2890 PRINT AT 7,0;"B - DELETE REGULAR TRANSACTION"
2900 PRINT AT 8,0;"C - ENQUIRE ON REGULAR TXNS"
2910 PRINT AT 9,0;"D - ADD A TRANSACTION"
2920 PRINT AT 10,0;"E - DELETE A TRANSACTION"
2930 PRINT AT 11,0;"F - ENQUIRE ON ALL TRANSACTIONS"
2940 PRINT AT 12,0;"G - ENQUIRE ON TXNS FROM DATE"
2950 PRINT AT 13,0;"R - RETURN TO MAIN MENU"
2960 IF INKEY$="" THEN GO TO 2960
2970 LET v$=INKEY$
2980 IF v$="A" OR v$="a" THEN RETURN
2990 IF v$="B" OR v$="b" THEN GO SUB 3100: GO TO 2850
3000 IF v$="C" OR v$="c" THEN GO SUB 3700: GO TO 2850
3010 IF v$="D" OR v$="d" THEN GO SUB 4150: GO TO 2850
3020 IF v$="E" OR v$="e" THEN GO SUB 4500: GO TO 2850
3030 IF v$="F" OR v$="f" THEN GO SUB 5000: GO TO 2850
3040 IF v$="G" OR v$="g" THEN GO SUB 6100: GO TO 2850
3050 IF v$="R" OR v$="r" THEN GO SUB 6000: GO TO 2850
3060 GO TO 2960
3100 CLS : PRINT AT 0,0;"REG TXN ADDITION DATE "id$
3110 PRINT AT 1,0;a$(1, 15)
3120 IF VAL(a$(1,16))<9 THEN GO TO 3190
3130 PRINT AT 11,0;"REG TXN TABLE FULL"
3140 PRINT AT 12,0;"PLEASE ENTER --"
3150 PRINT AT 14,0;"R - RETURN TO ACCOUNT MENU"
3160 IF INKEY$="" THEN GO TO 3150
3170 LET v$=INKEY$
3180 IF v$="R" OR v$="r" THEN RETURN
3190 GO TO 3150
3190 PRINT AT 7,0;"PLEASE ENTER DAY OF MONTH"
3200 PRINT AT 8,0;"(01-31)"
3210 INPUT LINE s$
3220 IF LEN(s$)>2 THEN GO TO 3270
3230 FOR j=1 TO 2
3240 IF s$(j)<"0" OR s$(j)>"9" THEN GO TO 3270
3250 NEXT j
3260 IF VAL(s$)=0 AND VAL(s$)<32 THEN GO TO 3280
3270 GO SUB 9990: GO TO 3210
3280 PRINT AT 2,0;"DAY "i$
3290 LET a$(1,20)=VAL(a$(1,16))+19 TO 20*VAL(a$(1,16))+20=s$
3300 PRINT AT 7,0;"PLEASE ENTER COMMENT"
3310 PRINT AT 8,0;"(UP TO 10 CHARACTERS)"
3320 GO SUB 9996
3330 INPUT LINE s$
3340 IF LEN(s$)=0 OR LEN(s$)>10 THEN GO SUB 9990: GO TO 3320
3350 LET a$(1,20)=VAL(a$(1,16))+21 TO 20*VAL(a$(1,16))+30=s$
3360 PRINT AT 7,0;"PLEASE ENTER AMOUNT"
3370 PRINT AT 8,0;"(PP PRECEDED BY 1-5 DIGITS)"
3380 GO SUB 9996
3390 INPUT LINE s$
3400 GO SUB 9000
3410 IF v$="1" THEN GO SUB 9990: GO TO 3390
3420 PRINT AT 4,0;"AMOUNT "i$
3430 LET a$(1,20)=VAL(a$(1,16))+31 TO 20*VAL(a$(1,16))+37=s$
3440 PRINT AT 7,0;"PLEASE ENTER DEBIT/CREDIT"
3450 PRINT AT 8,0;"('D' OR 'C')
3460 GO SUB 9996
3470 INPUT LINE s$

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3470 IF LEN(s$)>1 THEN GO SUB 9990: GO TO 3460
3480 IF s$="C" THEN LET s$="C"
3490 IF s$="D" THEN LET s$="D"
3500 IF s$="C" AND s$="D" THEN GO SUB 9990: GO TO 3460
3510 PRINT AT 5,0;"D/C "i$
3520 LET a$(1,20)=VAL(a$(1,16))+38=s$
3530 PRINT AT 7,0;"
3540 PRINT AT 8,0;"
3550 GO SUB 9996
3555 PRINT AT 11,0;"PLEASE ENTER 1 OF THE FOLLOWING"
3560 PRINT AT 13,0;"A - CONFIRM ADDITION"
3570 PRINT AT 14,0;"B - RE-ENTER DETAILS"
3580 PRINT AT 15,0;"R - RETURN TO ACCOUNT MENU"
3590 IF INKEY$="" THEN GO TO 3590
3600 LET v$=INKEY$
3610 IF v$="A" OR v$="a" THEN RETURN
3620 IF v$="B" OR v$="b" THEN GO TO 3100
3630 IF v$="R" OR v$="r" THEN GO TO 3590
3640 LET x=VAL(a$(1,16))
3650 LET a$(1,16)=STR$(x)
3660 LET v$="0"
3670 FOR j=1 TO x-1
3680 IF a$(1,20*j-1 TO 20*j+19) > a$(1,20*j+19 TO 20*j+38) THEN LET v$="1": LET b$
  #1 TO 20=a$(1,20*j-1 TO 20*j+18): LET a$(1,20*j-1 TO 20*j+18)=a$(1,20*j+19 TO 20*j+38): LET a$(1,20*j+19 TO 20*j+38)=b$
3690 NEXT j
3695 IF v$="1" THEN GO TO 3670
3697 RETURN
3700 CLS : PRINT AT 0,0;"REG TXN DELETION DATE "id$
3710 PRINT AT 1,0;a$(1, 15)
3720 IF a$(1,16)<"0" THEN GO TO 3800
3730 PRINT AT 11,0;"REG TXN TABLE EMPTY"
3740 PRINT AT 12,0;"PLEASE ENTER --"
3750 PRINT AT 14,0;"R - RETURN TO ACCOUNT MENU"
3760 IF INKEY$="" THEN GO TO 3760
3770 LET v$=INKEY$
3780 IF v$="R" OR v$="r" THEN RETURN
3790 GO TO 3760
3800 PRINT AT 7,0;"PLEASE ENTER REG TXN NUMBER"
3810 PRINT AT 8,0;"(1-15:VAL(a$(1,16)))"
3820 INPUT LINE s$
3830 IF LEN(s$)>1 THEN GO SUB 9990: GO TO 3820
3840 IF s$="1" OR s$=a$(1,16) THEN GO SUB 9990: GO TO 3820
3850 PRINT AT 7,0;"
3860 PRINT AT 8,0;"
3870 GO SUB 9996
3875 LET x=VAL(s$)
3880 PRINT AT 2,0;"DAY "i$(a$(1,20*x-1 TO 20*x))
3890 PRINT AT 3,0;"COMMENT "i$(a$(1,20*x+1 TO 20*x+10))
3900 LET a$(1,20*x+11 TO 20*x+17)=s$
3910 FOR j=1 TO 4
3920 IF a$(j)<"0" THEN GO TO 3940
3930 NEXT j
3940 LET a$=a$(j TO 5)+". "+a$(6 TO 7)
3950 PRINT AT 4,0;"AMOUNT "i$
3960 PRINT AT 5,0;"D/C "i$(a$(1,20*x+10))
3970 PRINT AT 11,0;"PLEASE ENTER 1 OF THE FOLLOWING"
3980 PRINT AT 13,0;"A - CONFIRM DELETION"
3990 PRINT AT 14,0;"B - RE-ENTER DETAILS"
4000 PRINT AT 15,0;"R - RETURN TO ACCOUNT MENU"
4010 IF INKEY$="" THEN GO TO 4010
4020 LET v$=INKEY$
4030 IF v$="A" OR v$="a" THEN RETURN
4040 IF v$="B" OR v$="b" THEN GO TO 3700
4050 IF v$="R" OR v$="r" THEN GO TO 4010
4060 FOR j=1 TO VAL(a$(1,16))-1
4070 LET a$(1,20*j-1 TO 20*j+18)=a$(1,20*j+19 TO 20*j+38)
4080 NEXT j
4090 LET x=VAL(a$(1,16))
4100 LET x=x-1
4110 LET a$(1,16)=STR$(x)
4120 RETURN
4150 CLS : PRINT AT 0,0;"REG TXN ENQUIRY DATE "id$
4160 PRINT AT 1,0;a$(1, 15)
4170 PRINT AT 3,0;"NO DAY COMMENT AMOUNT"
4180 FOR j=1 TO VAL(a$(1,16))
4190 PRINT AT j+3,1;j
4200 PRINT AT j+3,4;a$(1,20*j-1 TO 20*j)
4210 PRINT AT j+3,7;a$(1,20*j+1 TO 20*j+10)
4220 LET a$=a$(1,20*j+11 TO 20*j+17)
4230 FOR k=1 TO 4
4240 IF a$(k)<"0" THEN GO TO 4270
4250 LET a$=a$(k)+". "+a$(k+1 TO 6)
4260 NEXT k
4270 PRINT AT j+3,10;a$(1 TO 5): ". "+a$(6 TO 7)
4280 PRINT AT j+3,27;a$(1,20*j+18)
4290 NEXT j
4300 PRINT AT 14,0;"PLEASE ENTER --"
4310 PRINT AT 15,0;"R - RETURN TO ACCOUNT MENU"
4320 IF INKEY$="" THEN GO TO 4320
4330 LET v$=INKEY$
4340 IF v$="R" OR v$="r" THEN RETURN
4350 GO TO 4320
4500 CLS : PRINT AT 0,0;"TXN ADDITION DATE "id$
4505 PRINT AT 1,0;a$(1, 15)
4510 PRINT AT 7,0;"PLEASE ENTER REFERENCE"
4520 PRINT AT 8,0;"(UP TO 6 CHARACTERS)"
4530 INPUT LINE s$
4540 IF LEN(s$)=0 OR LEN(s$)>6 THEN GO SUB 9990: GO TO 4530
4550 PRINT AT 2,0;"REFERENCE "i$
4560 LET b$(8 TO 13)=s$
4570 PRINT AT 7,0;"PLEASE ENTER COMMENT"
4580 PRINT AT 8,0;"(UP TO 15 CHARACTERS)"
4590 GO SUB 9996
4600 INPUT LINE s$
4610 IF LEN(s$)=0 OR LEN(s$)>15 THEN GO SUB 9990: GO TO 4600
4620 PRINT AT 3,0;"COMMENT "i$
4630 LET b$(14 TO 20)=s$
4640 PRINT AT 7,0;"PLEASE ENTER AMOUNT"
4650 PRINT AT 8,0;"(PP PRECEDED BY 1-5 DIGITS)"
4660 GO SUB 9996
4670 INPUT LINE s$
4680 GO SUB 9000
4690 IF v$="1" THEN GO SUB 9990: GO TO 4670
4700 PRINT AT 4,0;"AMOUNT "i$
4710 LET b$(29 TO 35)=s$
4720 PRINT AT 7,0;"PLEASE ENTER DEBIT/CREDIT"
4730 PRINT AT 8,0;"('D' OR 'C')
4740 GO SUB 9996
4750 INPUT LINE s$
4760 IF LEN(s$)>1 THEN GO SUB 9990: GO TO 4750
4770 IF s$="C" THEN LET s$="C"
4780 IF s$="D" THEN LET s$="D"
4790 IF s$="C" AND s$="D" THEN GO SUB 9990: GO TO 4750
4800 PRINT AT 5,0;"D/C "i$
4810 LET b$(7)=s$
4820 PRINT AT 7,0;"
4830 PRINT AT 8,0;"
4840 GO SUB 9996
4850 PRINT AT 11,0;"PLEASE ENTER 1 OF THE FOLLOWING"
4860 PRINT AT 13,0;"A - CONFIRM ADDITION"
4870 PRINT AT 14,0;"B - RE-ENTER DETAILS"
4880 PRINT AT 15,0;"R - RETURN TO ACCOUNT MENU"
4890 IF INKEY$="" THEN GO TO 4890
4900 LET v$=INKEY$
4910 IF v$="A" OR v$="a" THEN RETURN
4920 IF v$="B" OR v$="b" THEN GO TO 4500
4930 IF v$="R" OR v$="r" THEN GO TO 4890
4940 LET b$( TO 6)=s$
4950 GO SUB 1500
4960 RETURN

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SPECTRUM PROGRAMS

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5000 CLS : PRINT AT 0,0;"TXN DELETION" DATE "id#
5010 PRINT AT 1,0;"(1,17 TO 18)" THEN GO TO 5100
5020 IF VAL (a$(1,17 TO 18))>0 THEN GO TO 5100
5030 PRINT AT 11,0;"TRANSACTION TABLE EMPTY"
5040 PRINT AT 12,0;"PLEASE ENTER -"
5050 PRINT AT 14,0;"R - RETURN TO ACCOUNT MENU"
5060 IF INKEY$="" THEN GO TO 5060
5070 LET v$=INKEY$
5080 IF v$="r" OR v$="R" THEN RETURN
5090 GO TO 5060
5100 PRINT AT 7,0;"PLEASE ENTER TRANSACTION NUMBER"
5110 PRINT AT 8,0;"(1-17 VAL (a$(1,17 TO 18)))"
5120 INPUT LINE n$
5130 IF LEN (n$)>0 OR LEN (n$)>2 THEN GO SUB 9999: GO TO 5120
5140 FOR j=1 TO LEN (n$)
5150 IF n$(j)<"0" OR n$(j)>"9" THEN GO SUB 9999: GO TO 5120
5160 NEXT j
5170 IF VAL (n$)>0 OR VAL (n$)>VAL (a$(1,17 TO 18)) THEN GO SUB 9999: GO TO 5120
5180 PRINT AT 2,0;"REFERENCE" t$(1,VAL (n$),0 TO 13)
5190 PRINT AT 3,0;"COMMENT" t$(1,VAL (n$),14 TO 20)
5200 LET w$=t$(1,VAL (n$),29 TO 35)
5210 FOR j=1 TO 4
5220 IF w$(j)<"0" THEN GO TO 5240
5230 NEXT j
5240 PRINT AT 4,0;"AMOUNT" t$(j,1 TO 5); t$(6 TO 7)
5250 PRINT AT 5,0;"D/C" t$(1,VAL (n$),7)
5260 PRINT AT 5,10;"DATED" t$(1,VAL (n$), TO 6)
5270 PRINT AT 7,0;"
5280 PRINT AT 8,0;"
5290 GO SUB 9999
5300 PRINT AT 11,0;"PLEASE ENTER 1 OF THE FOLLOWING"
5310 PRINT AT 13,0;"A - CONFIRM DELETION"
5320 PRINT AT 14,0;"B - RE-ENTER DETAILS"
5330 PRINT AT 15,0;"R - RETURN TO ACCOUNT MENU"
5340 IF INKEY$="" THEN GO TO 5340
5350 LET v$=INKEY$
5360 IF v$="r" OR v$="R" THEN RETURN
5370 IF v$="b" OR v$="B" THEN GO TO 5000
5380 IF v$="a" AND v$<"a" THEN GO TO 5340
5390 FOR j=VAL (n$) TO VAL (a$(1,17 TO 18))-1
5400 LET t$(1,j)=t$(1,j+1)
5410 NEXT j
5420 LET w$=VAL (a$(1,17 TO 18))
5430 LET k=w-1
5440 IF k<0 THEN LET a$(1,17 TO 18)="0" *STR$ (k): RETURN
5450 LET a$(1,17 TO 18)=STR$ (k): RETURN
5500 CLS : PRINT AT 0,0;"ALL ACCTS ENQUIRY" DATE "id#
5510 PRINT AT 2,4;"ACCOUNT BALANCE"
5520 LET k=0
5530 FOR j=1 TO accts
5540 PRINT AT j+2,1;a$(j, TO 15)
5550 LET y=VAL (a$(j,17 TO 18))
5560 IF y=0 THEN PRINT AT j+2,2;"0.00 C" GO TO 5670
5570 LET w$=t$(j,y,36 TO 42)
5580 FOR k=1 TO 4
5590 IF w$(k)<"0" THEN GO TO 5620
5600 LET w$(k)=" "
5610 NEXT k
5620 PRINT AT j+2,10;w$(1 TO 5); t$(6 TO 7)
5630 PRINT AT j+2,17;t$(j,y,43)
5640 LET k=VAL (w$)
5650 IF t$(j,y,43)="D" THEN LET k=-k
5660 LET w$=k
5670 NEXT j
5672 IF k>0 THEN PRINT AT accts+4,27;"C" GO TO 5676
5674 PRINT AT accts+4,27;"D" LET k=-k
5676 LET b$( TO 8)="000000000"
5680 LET b$(9-LEN (STR$ (k)) TO 8)=STR$ (k)
5690 FOR j=1 TO 5
5700 IF b$(j)<"0" THEN GO TO 5730
5710 LET b$(j)=" "
5720 NEXT j
5730 PRINT AT accts+3,10;"-----"
5740 PRINT AT accts+4,11;"TOTAL" t$(1 TO 6); t$(7 TO 8)
5750 PRINT AT 14,0;"PLEASE ENTER -"
5760 PRINT AT 10,0;"R - RETURN TO MAIN MENU"
5770 IF INKEY$="" THEN GO TO 5770
5780 LET v$=INKEY$
5790 IF v$="r" OR v$="R" THEN RETURN
5800 GO TO 5770
6000 CLS : PRINT AT 0,0;"TXN ENQUIRY" DATE "id#
6010 PRINT AT 1,0;"(1,17 TO 18)" TRANSACTIONS t$(1,17 TO 18)
6020 PRINT AT 10,0;"PLEASE ENTER START DATE"
6030 INPUT LINE n$
6040 IF LEN (n$)>6 THEN GO SUB 9999: GO TO 6030
6050 FOR j=1 TO 6
6060 IF n$(j)<"0" OR n$(j)>"9" THEN GO SUB 9999: GO TO 6030
6070 NEXT j
6070 PRINT AT 10,0;"
6080 GO SUB 9999
6090 LET q$=n$: GO TO 6120
6100 CLS : PRINT AT 0,0;"TXN ENQUIRY" DATE "id#
6110 PRINT AT 1,0;"(1,17 TO 18)" TRANSACTIONS t$(1,17 TO 18)
6115 LET q$="000000000"
6120 PRINT AT 0,12;"(1,q$)"
6130 PRINT AT 2,3;"COMMENT REF"
6140 PRINT AT 3,0;"NO DATE AMOUNT BALANCE"
6150 FOR j=1 TO VAL (a$(1,17 TO 18))
6160 IF t$(1,j,5 TO 6)+t$(1,j,3 TO 4)+t$(1,j,1 TO 2)+q$(5 TO 6)+q$(3 TO 4)+q$(1 TO 2) THEN GO TO 6190
6170 NEXT j
6180 LET b$(1)=f$: GO TO 6410
6190 FOR k=1 TO j+7
6200 PRINT TAB 0;t$(1,k,14 TO 20); t$(1,k,8 TO 13)
6210 PRINT TAB 0;
6220 IF k<10 THEN PRINT "0";
6230 PRINT k; t$(1,k, TO 6); " "
6240 LET w$=t$(1,k,29 TO 35)
6250 FOR i=1 TO 4
6260 IF w$(i)<"0" THEN GO TO 6290
6270 LET w$(i)=" "
6280 NEXT i
6290 PRINT w$(1 TO 5); t$(6 TO 7); " "
6300 PRINT t$(1,k,7); " "
6310 LET w$=t$(1,k,36 TO 42)
6320 FOR i=1 TO 4
6330 IF w$(i)<"0" THEN GO TO 6360
6340 LET w$(i)=" "
6350 NEXT i
6360 PRINT w$(1 TO 5); t$(6 TO 7); " "
6370 PRINT t$(1,k,43)
6380 IF k=VAL (a$(1,17 TO 18)) THEN LET b$(1)=f$: GO TO 6410
6390 NEXT k
6400 LET b$(1)=f$
6410 PRINT AT 20,0;"PLEASE ENTER -"
6420 PRINT AT 21,0;"R - RETURN "
6430 IF b$(1)="a" THEN PRINT "OR H - MORE TXNS"
6440 IF INKEY$="" THEN GO TO 6440
6450 LET v$=INKEY$
6460 IF v$="r" OR v$="R" THEN RETURN
6470 IF b$(1)="f" THEN GO TO 6440
6480 IF v$<"a" AND v$<"h" THEN GO TO 6450
6490 LET j=j+0
6500 PRINT AT 3,31;
6505 FOR k=1 TO 10
6510 PRINT "
6520 NEXT k
6530 PRINT AT 3,31;
6540 GO TO 6190
7000 CLS : PRINT AT 11,0;"DO YOU WISH TO RESAVE?"
7010 PRINT AT 12,0;"(Y OR N)"

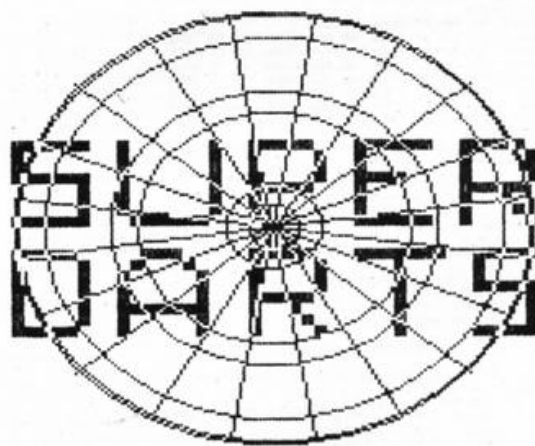
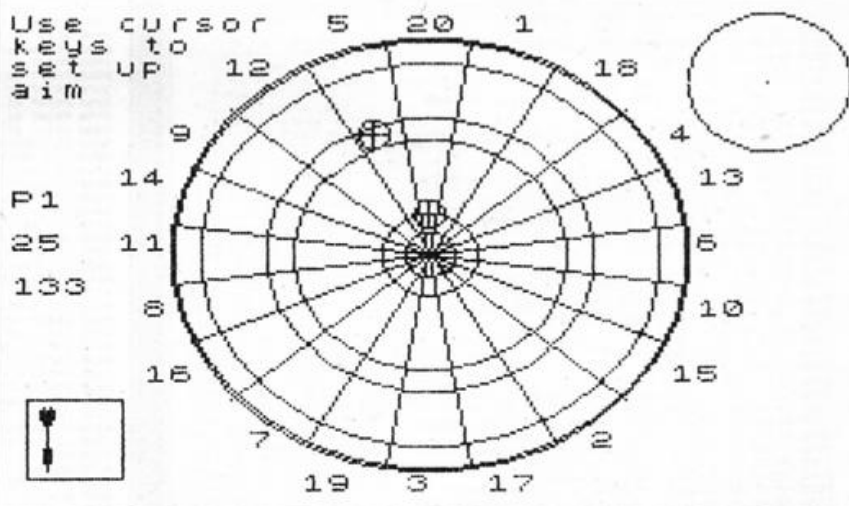
```

```

7020 IF INKEY$="" THEN GO TO 7020
7030 LET v$=INKEY$
7040 IF v$="n" OR v$="N" THEN CLS : RETURN
7050 IF v$<"y" AND v$<"Y" THEN GO TO 7020
7060 LET t=t+1: IF t=4 THEN LET t=1
7070 PRINT AT 14,0;"T.O.K. - NEXT TAPE IS NO "t
7080 LET p$=t$
7090 SAVE "accounts" LINE 100
7070 PRINT AT 11,15;"VERIFY"
7075 PRINT AT 14,0;"
7080 IF INKEY$="" THEN GO TO 7080
7090 LET v$=INKEY$
7100 IF v$="n" OR v$="N" THEN CLS : RETURN
7110 IF v$<"y" AND v$<"Y" THEN GO TO 7080
7120 PRINT AT 11,0;"IF THE VERIFY FAILS ENTER"t"AT 12,0;" GO TO 7040 TO RESAVE":
PAUSE 250
7130 VERIFY "accounts"
7140 CLS : PRINT AT 11,0;"DATA VERIFIED SUCCESSFULLY"
7150 RETURN
9000 LET k=LEN (n$)
9010 IF k<4 OR k>8 THEN GO TO 9190
9020 IF n$(k-2)<"." THEN GO TO 9190
9030 FOR j=1 TO k-3
9040 IF n$(j)<"0" OR n$(j)>"9" THEN GO TO 9190
9050 NEXT j
9060 FOR j=k-1 TO k
9070 IF n$(j)<"0" OR n$(j)>"9" THEN GO TO 9190
9080 NEXT j
9090 LET n$=n$-2 TO k-1;n$(k-1 TO k)
9100 IF VAL (n$)=0 THEN GO TO 9190
9110 LET v$="v"
9120 LET w$="000000000"
9130 LET w$(9-k TO 7)=n$
9140 FOR j=1 TO 4
9150 IF w$(j)<"0" THEN GO TO 9170
9160 NEXT j
9170 LET w$=t$(j TO 5); t$(6 TO 7)
9180 RETURN
9190 LET v$="i": RETURN
9996 PRINT AT 21,0;"
9997 RETURN
9998 PRINT AT 21,0;"FLASH 1: INVALID RESPONSE - PLEASE RETRY"
9999 RETURN

```

How Super Darts will look on your screen



Super Darts is available on cassette for £3.50, including postage and packing. Send a cheque or postal order, made out in the name of M. Stanger, to Super Darts, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. Your cassette will arrive within 28 days. This offer expires six weeks from the date of this issue of Home Computing Weekly.

SOFTWARE REVIEWS

The Crypt 48K Spectrum £4.95

Carnell, North Weylands Ind. Est., Molesey Rd, Hersham, Surrey KT12 3PL

You must defeat Satan by finding a sacred crucifix, hidden in one of the many crypts.

Each contains obstacles, a monster, and a chest which may help you. Your's and the monster's strength is given as well as your food and gold levels. It's best to avoid the monsters but you can fight if you are carrying a sword.

Keys are well chosen but the keyboard reading is very imprecise and the movement slow. On moving into a different crypt a blood cell attack is sometimes reported which

requires quick reactions. To escape death in Frankenstein's crypt you must press a seemingly irrelevant key.

There are six levels, accessed by a password which you are only told after completing the previous level. You are told the first. There is a good range of monsters but no apparent difference in character.

The locations appear to be totally random — if you return to a crypt you will find a different monster and a changed layout of obstacles.

I didn't find this inspiring. It poses a limited challenge as an adventure and is too slow for an arcade game. S.E.

instructions	50%
playability	40%
graphics	62%
value for money	55%



Pacific War 48K Spectrum £6

CCS, 14 Langton Way, London SE3 7TL

You control the American forces in the Battle of the Eastern Solomons, which took place during August 1942.

The Japanese, commanded by your Spectrum, intend to reinforce their troops on the island of Guadalcanal and you must destroy the Japanese task forces.

There are nine skill levels, and you can select the starting points of your task forces. On the map only your ships and aircraft are shown, so you must despatch search aircraft to find the enemy positions.

You can send out air strike

forces by selecting the appropriate aircraft and their target position, remembering the ships may have moved by the time your aircraft reaches them.

You are also able to assign some of your fighters to Combat Air Patrol to help defend your ships. However, you are limited to three air missions per carrier.

After each game turn the status of each task force is displayed and the score given.

An absorbing game, but I would have preferred more information on strategy and tactics. S.E.

instructions	80%
playability	70%
graphics	65%
value for money	80%



War 70 48K Spectrum £6

CCS, 14 Langton Way, London SE3 7TL

A two-player war game set in the mid-18th century. The aim is to capture your opponent's capital by occupying it for three days. For each day you have the option of regrouping any of your nine armies and you can move up to four groups of armies.

When opposing forces meet play switches to a map of the battlefield — each of the 32 locations has a different map.

Each player then sets the destination co-ordinates of each unit. If a unit is within close range of the enemy you may fire. The unit will return fire and casualties calculated. If two units

meet hand-to-hand fighting takes place.

Artillery can fire over a long distance, but it is difficult to judge angles and range. A unit is defeated when it is less than a third full strength or it has failed two morale tests, depending on casualties, officers and a random factor. When all of an army's units have been defeated the battle ends and play returns to the main map.

An interesting game that takes too long — and you must find an opponent. S.E.

instructions	60%
playability	55%
graphics	50%
value for money	75%



Now get out of these

...Our reviewers managed to return with their ratings of new strategy and adventure games

Classic Adventure 48K Spectrum £6.95

Melbourne House, 131 Trafalgar Rd, London SE10

This really is what it suggests, the classic Dungeons and Dragons type text-only adventure. And as such it's superb! No manual with this. The barest instructions leave you lots to explore.

You find yourself outside a building. After much wandering, you may eventually find the entrance to the underground maze of caverns, and it's huge! I say may, because part of the enjoyment of a decent adventure is trying to work out the rules and how to move around. Much pleasure is gained from trying to outwit the programmer.

There are dragons, trolls, dwarves, all unfriendly, and you can collect diamonds, golden eggs, nuggets and so on. You will find various objects to help, but I never met a friendly creature yet. One of the delights is the cruel humour. Once you reach the cavern called Witts End, you're really in trouble, and should you type in a naughty word out of frustration, the result is entertaining to say the least.

Every Spectrum owner should have this. It's excellent, but be warned, it's also very addictive. Previously published as Adventure 1 by Abersoft at £9.95 D.M.

instructions	N/A
playability	95%
graphics	N/A
value for money	90%



Pirate Adventure 32K BBC

Adventure International, 119 John Bright St, Birmingham B1 1BE

An original Scott Adams adventure. I couldn't help noticing a few Americanisms in the output. But, it is yet another good adventure.

There aren't too many instructions and I suspect this is to make the game the more interesting. You use two-word commands and N,S,W etc. to move.

The game starts in a building. After collecting the very important book and safety sneakers you transport yourself to Pirate Island where you need to build a boat to cross to Treasure Island.

This stage is very difficult and needs a lot of thought. Some things seem so obvious they can't be true but you must try every approach.

It's disappointing there are no graphics. However, this would limit the large vocabulary. Even so, I have spent ages trying to explain what I want to do.

The cassette presentation is of a good standard and at least the words are different colours to distinguish commands from the answers and information from objects during the actual game. Anyone could spend ages playing this game. If you can master it, other, later adventures are harder. D.B.

instructions	40%
ease of use	70%
display	70%
value for money	80%



CHARTBUSTERS

BRITAIN'S SOFTWARE CHARTS

by the ASP Market Research Group

ARCADE

1 Atic Atac	Ultimate	Spectrum(3)
2 Jet Set Willy	Software Projects	Spectrum(2)
3 Space Pilot	Anirog	CBM 64(-)
4 Manic Miner	Software Projects	Spectrum(-)
5 Manic Miner	Software Projects	CBM 64(-)
6 Bongo	Anirog	VIC-20(-)
7 Light Cycles	PS	Spectrum(-)
8 Falcon Patrol	Virgin	CBM 64(4)
9 Hunchback	Ocean	Spectrum(-)
10 Flying Feathers	Bubble Bus	CBM 64(-)

NON-ARCADE

1 Twin Kingdom Valley	Bug-Byte	CBM 64(-)
2 Golf 64	Abrasco	CBM 64(-)
3 Hobbit	M.House	Spectrum(2)
3 Home Manager	Abrasco	CBM 64(-)
5 Golf Spectrum	Abrasco	Spectrum(-)
6 Twin Kingdom Valley	Bug-Byte	BBC(-)
7 Pool	CDS	Spectrum(-)
8 Mad Martha	Microgen	Spectrum(-)
9 Dragonbane	Quicksilva	Spectrum(-)
10 The Valley	APS	VIC-20(-)

Compiled with the assistance of Britain's leading software distributors, including: Pinnacle, SDL, PCE, Websters, PCS and Software Centre.

SPECTRUM

1 Jet Set Willy	Software Projects (2)
2 Chequered Flag	Psion (4)
3 Scuba Dive	Durrell (6)
4 Atic Atac	Ultimate (1)
5 Hunchback	Ocean (-)
6 Flight Simulation	Psion (10)
7 Lunar Jetman	Ultimate (2)
8 Pogo	Ocean (7)
9 Snowman	Quicksilva (-)
10 Speed Duel	DK'tronics (-)

COMMODORE 64

1 Crazy Kong	Interceptor (3)
2 Buga Boo (The Flea)	Quicksilva (6)
3 Revenge of the Mutant Camels	Llamosoft (-)
4 Super Blitz	Commodore (-)
5 Manic Miner	Software Projects (2)
6 Chinese Juggler	Ocean (10)
7 Depth Charge	Commodore (-)
8 Mr Wimpy	Ocean (-)
9 Tank Attack	Superior (-)
10 Hobbit 64	M.House (-)

DRAGON 32

1 Chuckle Egg	A&F (1)
2 Up Periscope	Beyond (7)
3 Pedro	Imagine (8)
4 Hungry Horace	M.House (6)
5 Devil Assault	Microdeal (-)
6 Ring of Darkness	Wintersoft (-)
7 Frogger	Microdeal (10)
8 Kriegspiel	Beyond (3)
9 Dragon Chess	Oasis (-)
10 Skramble	Microdeal (-)

Compiled by W. H. Smith and Websters. Figures in brackets are last week's positions.

VIC-20

1 Snooker	Visions (-)
2 Crazy Kong	Interceptor (2)
3 Wizard and the Princess	M.House (3)
4 Flight 015	Ferranti/Davenport (1)
5 Jet Pac	Ultimate (6)
6 Gridrunner	Llamosoft (9)
7 Arcadia	Imagine (8)
8 Snowman and Maths Maze	Commodore(7)
9 Race	Commodore (-)
10 Supravaders/Bomber Run	K-tel (-)

HOME COMPUTING WEEKLY

BRITAIN'S BRIGHTEST

ZX81

1 Mothership	Sinclair (-)
2 Crazy Kong	PSS (3)
3 Fantasy Games	Sinclair (-)
4 Flight Simulation	Sinclair (-)
5 Space Raiders	Sinclair (-)
6 Asteriods	Quicksilva (2)
7 Skramble	Quicksilva (1)
8 Chess 1K	Sinclair (-)
9 Football Manager	Addictive (4)
10 Defenders	Quicksilva (5)

Tiger distribution

Tiger
distribution

Tiger distribution

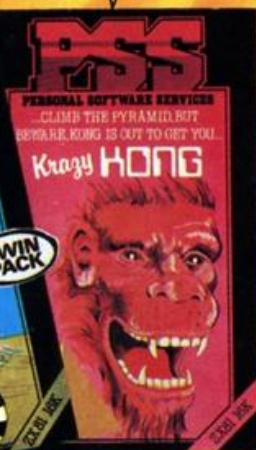
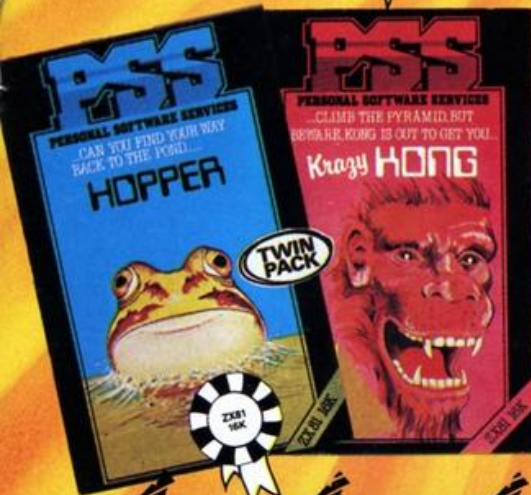
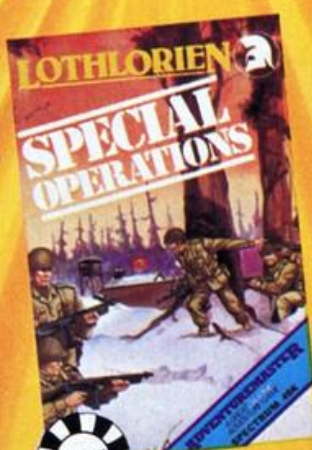
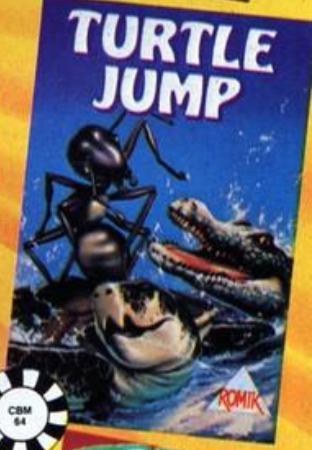
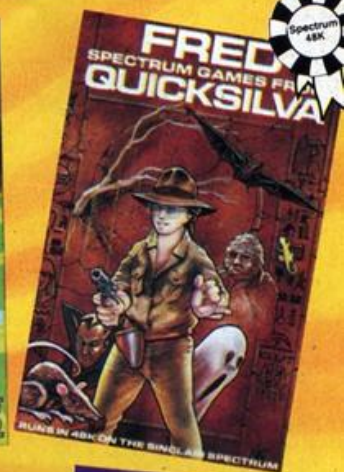
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John Menzies

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Glug-Glug 48K Spectrum £5.95

CRL, 9 Kings Yard, Carpenters Row, London

This is a beauty! You are a fearless deep sea diver recovering sunken treasure. The snag is that the treasure is guarded by a succession of nasty sea creatures. The better you do, the nastier the mixture gets! There are 32 different screens, which should keep you quiet for a while.

The basic layout shows a boat on the surface and the diver below, connected by lifeline. Protected by his quick-firing dart gun, he can be controlled from either keyboard or Protek/Kempston joystick to collect the treasure. Diver and beasts scroll around smoothly with unpleasant, but nicely

represented, things happening when fighting fish, giant squids and octopus get to you. Beware the crabs, which are impenetrable, and the hunter sharks which go for the lifeline. All in all, super graphics, but the sound, though good quality, is a bit sparse.

The nice feature is that anyone can succeed to some extent; points are gained by shooting assailants. If you want to reach the next level however, you must collect the treasure. The result of this well judged level of difficulty is that there's something here for everyone, young or old, expert or beginner. Recommended. **D.M.**

instructions	95%
playability	100%
graphics	95%
value for money	90%



Dr Franky and the Monster 48K Spectrum £5.95

Virgin, 61/63 Portobello Rd, London W11 3DD

You control Dr Franky who must turn his monstrous creation into a human being by collecting flasks of life-giving chemicals placed in his dungeons. Unfortunately, the people he used to make the monster have turned into ghosts and are desperate for revenge.

You must jump up the holes on each platform to reach the flask, which you must then take to the dormant monster on the far side.

Be quick or else the ghosts trap you and collision means death. You must also avoid the layer of

bricks that move down the gap in the centre of the screen and the truck which crosses the top platform.

There also appears to be a time limit because Dr Franky appears to die for no other apparent reason if you wait around too long. Controls are simple but response can be slow at times which makes Dr Franky difficult to control. There are nine different dungeons and a magic hammer will help you on some.

The main drawback is that this game is fiendishly difficult to play. There are too many ghosts for my liking and they are far too intelligent! **S.E.**

instructions	75%
playability	50%
graphics	75%
value for money	70%



Doomsday Castle 48K Spectrum £6.50

Fantasy, Fauconberg Lodge, 27A St George's Rd, Cheltenham Glos GL50 3DT

The scenario is a little odd, because you are exploring a fantasy castle using something like a space capsule. This slightly spoils the usual illusion, but not much because this is an excellent attempt to turn an adventure into an arcade-style game.

You must explore the castle in your capsule, seeking to restore the six lost elven stones. The castle consists of 25 main chambers connected by 49 corridors. Each is infested with monsters with quaint and frightening names like Urks,

Googly birds and Garthogs. Each has its own pattern of behaviour and the result is a linked arcade game of 74 screens in which the player has some choice over which screen he or she will play, providing the castle has already been explored. This, of course, is not easy.

Graphics are excellent. The game is compulsive, varied, entertaining, well balanced, well designed and has a pause feature for when things become too much. I particularly like (= hate) the way the Googly bird will suddenly wake and send deadly thread bouncing around. Highly recommended. **N.W.**

instructions	90%
playability	95%
graphics	95%
value for money	90%



Monsters in all shapes and sizes

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beasties in this selection of
new Spectrum games, star-
rated by our team

Ed On Spectrum £5

CCI, Units 2, 3 and 4, Shire Hill Industrial Estate, Saffron Walden, Essex CB11 3AQ

I didn't think it would take long before someone produced a souped-up machine code version of this old favourite of the magazine listings.

You play a racing car trapped within a maze. Your job is to collect all the dots — don't ask me why — while avoiding the computer controlled car. Your only defence against collision is to change lanes at the last possible second, since the computer follows you closely. You also have full speed control, which is very important in trying to outwit the computer's car which only travels at one speed. It sounds deceptively simple.

In fact I have only managed to clear the first screen once, after which there are no less than two of the turbo-charged terrors to contend with. A nice touch are flags which can be picked up for bonus points, but these tend to keep the mind from the task in question: avoiding the computer's car.

Sound and graphics are nothing to write home about, but comprehensive instructions are supplied and the game is fun. It does my ego good to beat the computer at something, and this game ensures this doesn't happen very often. **T.B.**

instructions	90%
playability	80%
graphics	50%
value for money	50%



Bimbo Spectrum £5.45

Joe the Lion, 157 Market St, Hyde, Cheshire SK14 1HG

Strange game this — cross between Watership Down and Tranz-Am! A moving maze scrolls in all directions as you control Bimbo the Rabbit. You have to get Bimbo to eat carrots, drop apples to distract pursuing black rabbits and avoid holes. Extra points are gained by eating clover. Your radar (Radar? For rabbits? Ah well.) shows the location of carrots, Bimbo and the black turbos... sorry, rabbits. Eat all 10 carrots on each level to reach the next, but when you do, more black rabbits appear. The more you chase about, the more

your energy level drops and the more carrots you need to eat. Every fourth level, there are no pursuers, just a race against time to get the fuel... sorry, carrots.

Graphics are quite well done, though distinctly 2D. And boy, is this game fast! The inlay card says 100,000 is good, 250,000 brilliant. I couldn't even raise 1,000! There ought to be variable difficulty levels.

Although professionally produced, with good presentation, the concept just isn't original or addictive enough. It hasn't been done with rabbits before but... **D.M.**

instructions	95%
playability	80%
graphics	80%
value for money	70%





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PCW REVIEW. 29/3/84. ...worth the wait... possibly even better than the original! Different elements include the much wider variety of screen layouts, the chance to go through rooms in more or less any order and special obstacles like swinging ropes. It's technically brilliant, funny, and of course, completely addictive. Work halted for several hours when it arrived in the office.

2 HOUR DESPATCH PLEDGE

PCW REVIEW. 15/3/84. ...one of the best Spectrum games I've seen this year... a cross between Timegate, Star Raiders and Star Trek, but with dozens of extra features and 3D sprite graphics... other features include warp drive and 3D logic i.e. everything moves on the scanners according to true spacial logic... amazing graphics... in terms of current pricing policies for Spectrum programs its worth twice its price.

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jet set



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Moon Lander by Yarko Blahyj

Use your skill and judgement to land your spacecraft on the moon's surface.

But don't descend any faster than 20mph or the consequences will be serious. This game needs a joystick.

- We always insert REMs in Commodore listings as an aid to recognising the control characters as you type in the programs. These REMs should not be entered.

**Sound Effects
by M. Serbert**

Here are a few sound effects I use in my hobby, writing adventure games. I would like to see what other readers could produce.

Lines 1 to 5 set up the sound variables and 10 to 100 print the selection menu.

Each sound is then generated in a separate subroutine so they can be used individually.

The menu numbers correspond with the routines, so sound No. 1 starts at line 1000.

The subroutine at line 10000 simply clears all the sound registers and this is called at the start of every sound to be generated.

The routines are straightforward, short loops and mainly voice 1. The sounds are generated by POKEing values into the variables.

Variables

Wf waveform
Hf high frequency voice 1
Lf low frequency voice 1
H3 high frequency voice 3
L3 low frequency voice 3
VO volume control
AD attack and decay voice 1
SR sustain and release voice 1

Listing 1 — Moon Lander

```

01 REM[CLR]
10 PRINT "POKE550,128: C=53280: C=53281: POKE53280,64: POKE53281,28
21 PRINTCHR$(8): FORN=0TO62: READP: POKE532+H,0: NEXT
25 REM(CRSR DOWN)[7 CRSR RIGHT][CVN]
30 PRINT "XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
35 REM(2CRSR DOWN)[2 CRSR RIGHT]
40 PRINT "XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
45 REM(2 CRSR RIGHT)
50 PRINT "XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
55 REM(2 CRSR RIGHT)
60 PRINT "XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
65 REM(2 CRSR RIGHT)
70 PRINT "XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
74 REM[BLK][2 CRSR DOWN][RVS ON][RVS OFF][2 CRSR DOWN][9 CRSR LEFT][RVS ON]
75 PRINTSPC(13): "XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX"
90 GETA: IFA$="" THEN10
91 IFA$="Y" THEN110
92 IFA$="N" THEN120
100 GOTO90
105 REM[CLR][BLK]
110 PRINT "PRINTSPC(14): "MOON LANDER"
120 PRINTSPC(14): "
125 REM(CRSR RIGHT)
130 PRINT "MIN THIS GAME YOU MUST USE YOUR SKILL"
135 REM(CRSR RIGHT)
140 PRINT "AND JUDGEMENT TO LAND YOUR CRAFT >XII!"
145 REM(CRSR RIGHT)
148 PRINT "ON THE MOON SURFACE."
155 REM(CRSR DOWN)[CRSR RIGHT][RVS ON][RVS OFF]
190 PRINT "X **LEFT = LEFT**"
195 REM(CRSR DOWN)[CRSR RIGHT][RVS ON][RVS OFF]
198 PRINT "X **RIGHT = RIGHT**"
199 REM(CRSR DOWN)[CRSR RIGHT][RVS ON][RVS OFF]

```

```

200 PRINT"***STATIONARY = FIRE***"
201 REM(CRSR DOWN)(CRSR RIGHT)(CRS ONICRS OFF)
205 PRINT"***STATIONARY = UP/FIRE***"
206 REM(CRSR DOWN)(CRSR RIGHT)
210 PRINT"***TO MAKE A SAFE LANDING YOU MUST GO"
212 PRINT"***LESS THAN 20MPH, IF YOU GO ANY FASTER"
214 PRINT"***THEN YOU WILL CRASH AND DIE." PRINTSPC(8)"***JOYSTICK ***ONLY***"
216 PRINT"***PRESS F1 TO PLAY GAME"
236 GETA:IF A$=""THEN236
237 IF A$="M"THEN240
238 GOTO236
240 PRINT"7: POKE0,0:POKE4+1,0
245 H=300:FL=100:P=100:T1$="000000":V=53248:HT=H
246 INT(RND(1)*181):CRASH=HTEN246:R=INT(RND(1)*162):IF R<65THEN246
247 POKEV+4,R:POKEV+5,45
248 IF H<100THEN245:IF HT=0THENHT=300
249 H=H*PEEK(56321)/AND15:F=PEEK(56321)/AND16
255 H=56516:POKEH+0,0:POKEH+1,0:POKE1344+R,67:POKE1344+A+1,67
300 PRINTTAB(4)*25
350 PRINT" I HT PRINTTAB(5)"H" PRINTTAB(19)"TISPEED I"P:"I PRINTTAB(33)"T
360 PRINT" I PRINTTAB(5)"H" PRINTTAB(19)"TIFUEL I"FL:"I PRINTTAB(33)"T
370 PRINT" I PRINTTAB(5)"H" PRINTTAB(19)"TIFUEL I"FL:"I PRINTTAB(33)"T
380 PRINT" I PRINTTAB(5)"H" PRINTTAB(19)"TIFUEL I"FL:"I PRINTTAB(33)"T
390 PRINT" I"100 PRINTTAB(5)"H" PRINTTAB(19)"TIFUEL I"FL:"I PRINTTAB(33)"T
400 PRINT" I PRINTTAB(5)"H" PRINTTAB(19)"TIFUEL I"FL:"I PRINTTAB(33)"T
410 PRINT" I G PRINTTAB(5)"H" PRINTTAB(19)"TIFUEL I"FL:"I PRINTTAB(33)"T
420 PRINT" I G PRINTTAB(5)"H" PRINTTAB(19)"TIFUEL I"FL:"I PRINTTAB(33)"T
430 POKEV+21,1:POKEV+39,15:POKE2040,13
441 IF P=100THENK=2
442 IF P<50THENK=1
443 IF P<10THENK=.25
444 IF P<150THENK=3
445 IF P<200THENK=5
447 IF (SAND1)THENV=Y+K
450 IF (SAND2)THENV=Y+K:H=H+K
455 IF (SAND3)THENX=X+2
456 IF FL<0THENPRINT"YOU RAN OUT OF FUEL!"*10020
460 IF V=0THENV=Y+K:H=H+K:P=0:FL=FL-10:IF FL<0THENV=Y+K:P=P+0
462 IF H<200THENK=300
470 IF S<0THENV=Y+K:H=H+K:P=P+10
480 IF X<161THENV=161
490 IF X<64THENV=64
500 IF Y<45THENV=45
510 IF V>99THENV=99:P=P+0:GOTO7000
4500 POKEV+0,X:IF X<254THENX=254
4600 POKEV+1,Y
4650 GOTO249
4700 DATA 0,0,0,0,0,0,0,0,0,0,0
4800 DATA 0,0,0,0,0,0,0,0,0,0,0
4900 DATA 0,0,0,0,0,0,0,0,0,0,0
5000 DATA 0,0,0,0,0,56,0,0,124,0
5100 DATA 186,0,0,214,0,0,254,0
5200 DATA 254,0,0,254,0,1,17,0
5300 DATA 16,129,7,57,192
7000 PRINT"7: POKE1,1:POKE4+1,1:POKEV+41,1:POKEV+21,4
7010 POKE3281,28:IF P<30THENPRINT"YOU CRASHED AT P:"P"V:"V"SC=0:GOTO7000

```

```

7019 SC=1/END(1)*300)
7020 IF=7C+HARDWI+H#56232THEN8090
7030 IF=84+HARDWI+H#56244THEN8090
7040 IF=X#2+HARDWI+H#56252THEN8090
7050 IF=X#100+HARDWI+H#56262THEN8090
7060 IF=X#100+HARDWI+H#56272THEN8090
7070 IF=X#116+HARDWI+H#56282THEN8090
7080 IF=X#124+HARDWI+H#56292THEN8090
7090 IF=X#132+HARDWI+H#56302THEN8090
7100 IF=X#140+HARDWI+H#56312THEN8090
7110 IF=X#148+HARDWI+H#56322THEN8090
7120 IF=X#156+HARDWI+H#56332THEN8090
8090 PRINT"*****WELL DONE, YOU
        LINED IN "I1;" SECS"
9000 PRINT"*****YOU SCORED:";SC
10020 PRINT"***** CARE TO TRY AGAIN **
10030 GOTO IFR# IFR# THEN10030
10040 IFR#="N" GOTO IFR# THEN10030
10050 IFR#="Y" THEN10030
10060 GOTO10030

```



space skills ends you use

Listing 2 — Sound Effects

```

1 REM INITIALISE VOICE (1)
2 SS=54272:LF=SS:HF=SS+1:AD=SS+5
3 SR=SS+6:WF=SS+4:VO=SS+24
4 H3=SS+15:L3=SS+14
5 REM-----
6 REM [CLR][BLK]
7 PRINT "M" POKE53281,6:POKE53280,11
8 PRINT "M" CHOOSE YOUR COMMODORE SOUND EFFECT"
9 REM [2 CSR DOWN]
10 PRINT "M" 1) ... FLYING A HELICOPTER"
11 REM [CSR DOWN]
12 PRINT "M" 2) ... HELICOPTER CRASHING"
13 REM [CSR DOWN]
14 PRINT "M" 3) ... AMBULANCE PASSING"
15 REM [CSR DOWN]
16 PRINT "M" 4) ... TELEPHONE RINGING"
17 REM [CSR DOWN]
18 PRINT "M" 5) ... JAILBREAK SIREN"
19 REM [CSR DOWN]
20 PRINT "M" 6) ... EXPLOSION NOISE"
21 REM [CSR DOWN]
22 PRINT "M" 7) ... TELETXT MACHINE"
23 REM [CSR DOWN]
24 PRINT "M" 8) ... POLICE CAR NEARBY"
25 REM [CSR DOWN]
26 PRINT "M" 9) ... 4 SPECIAL EFFECTS"
27 REM [2 CSR DOWN][VE][BLK]
28 INPUT "M" 9) ... CHOOSE YOUR NUMBER" :NO
29 IFNO=0 THEN GOTO 100
30 IFNO=1 THEN GOSUB 1000:2000,3000,4000,5000,6000,7000,8000,9000
31 GOTO 10
32 REM-----
33 GOSUB 10000
34 FORN=180T00STEP-1
35 POKEAD,0:POKEHF,0:POKEHF,X
36 POKEVO,15:POKEAD,13:POKESR,0
37 POKEHF,129:POKEHF,X:POKEHF,255
38 POKEHF,17:POKEHF,X
39 FORT=1T025:NEXTT
40 NEXTX
41 POKEVO,0
42 RETURN
43 REM-----
44 GOSUB 10000
45 FORN=180T00STEP-1
46 POKEAD,0:POKEHF,0:POKEHF,X
47 POKEVO,15:POKEAD,13:POKESR,0
48 POKEHF,129:POKEHF,X:POKEHF,255
49 POKEHF,17:POKEHF,X
50 FORT=1T025:NEXTT
51 NEXTX
52 POKEVO,0:GOSUB 6000
53 RETURN
54 REM-----
55 GOSUB 10000
56 FORN=1T010
57 POKEVO,15:POKEAD,0:POKESR,240
58 POKEHF,33:POKEHF,75:POKEHF,34
59 FORT=1T0300:NEXTT
60 POKEHF,52:POKEHF,43
61 FORT=1T0300:NEXTT
62 NEXTX
63 POKEVO,0
64 RETURN
65 REM-----
66 GOSUB 10000
67 FORN=1T04
68 POKEVO,15:POKEAD,9:POKESR,220
69 POKEHF,17
70 FORT=1T02
71 FORZ=1T015
72 POKEHF,17:POKEHF,68:POKEHF,149
73 FORP=1T05:NEXTP
74 POKEHF,0:POKEHF,0
75 NEXTZ
76 FORP=1T0100:NEXTP
77 NEXTT
78 FORP=1T0500:NEXTP
79 NEXTX
80 POKEVO,0
81 RETURN
82 REM-----
83 GOSUB 10000
84 FORN=1T010
85 POKEVO,15:POKEAD,13:POKESR,0
86 POKEHF,33:POKEHF,10:POKEHF,187
87 FORT=1T0100
88 POKEHF,T:POKEHF,67
89 NEXTX
90 POKEVO,0
91 RETURN
92 REM-----
93 GOSUB 10000
94 FORN=15T01STEP-1
95 POKEVO,X:POKEAD,13:POKESR,0
96 POKEHF,129:POKEHF,15:POKEHF,15
97 FORT=1T0200:NEXTT
98 NEXTX
99 POKEVO,0
100 RETURN
101 REM-----
102 GOSUB 10000
103 FORN=15T01STEP-1
104 POKEVO,15:POKEAD,0:POKESR,240
105 POKEHF,21:POKEHF,19:POKEHF,136
106 FORN=0T065535 STEP1500
107 GOSUB 11000
108 NEXTX
109 FORN=65535T00STEP-1500
110 GOSUB 11000
111 NEXTX
112 POKEVO,0
113 NEXTZ
114 POKEVO,0
115 REM-----SPACE NOISE 2**
116 FORT=1T01000:NEXTT:FORZ=1T02
117 POKEVO,15:POKEAD,0:POKESR,240
118 POKEHF,35:POKEHF,9:POKEHF,136

```

```

7005 REM[CLR]
7010 ME#="3 THIS IS A DEMONSTRATION OF A TELETXT
      PRINTING MACHINE SOUND".

```

```

7020 L=LEN(ME#)
7030 FORX=1T0L:PRINT MID$(ME#,X,1)
7040 POKEVO,7:POKEAD,240:POKESR,0
7050 POKEHF,17:POKEHF,4:POKEHF,0
7060 FORT=1T050:NEXTT
7070 POKEVO,0
7080 NEXTX
7090 POKEVO,0
7100 RETURN
7110 REM-----
7120 GOSUB 10000
7130 FORN=1T015
7140 IFN=15 THEN FORN=15T01STEP-1
7150 POKEVO,X
7160 POKEAD,64:POKESR,128:POKEHF,17
7170 POKEHF,3:POKEHF,99
7180 FORT=1T0100
7190 POKEHF,T
7200 NEXTX
7210 POKEVO,0
7220 RETURN
7230 REM-----
7240 GOSUB 10000
7250 FORZ=1T03
7260 POKEVO,15:POKEAD,0:POKESR,240
7270 POKEHF,21:POKEHF,19:POKEHF,136
7280 FORN=0T065535 STEP1500
7290 GOSUB 11000
7300 NEXTX
7310 FORN=65535T00STEP-1500
7320 GOSUB 11000
7330 NEXTX
7340 POKEVO,0
7350 NEXTZ
7360 POKEVO,0
7370 REM-----SPACE NOISE 3**
7380 FORT=1T01000:NEXTT:FORZ=1T02
7390 POKEVO,15:POKEAD,0:POKESR,240
7400 POKEHF,35:POKEHF,9:POKEHF,136

```

```

9034 FORN=65535T00STEP-900:GOSUB 11000
9035 NEXTX
9036 FORN=0T065535STEP900:GOSUB 11000
9037 NEXTX
9038 NEXTZ
9039 POKEVO,0
9040 REM-----SPACE NOISE 3
9041 GOSUB 10000
9042 FORT=1T0500:NEXTT
9043 FORZ=1T0150
9044 POKEVO,15:POKEAD,9:POKESR,220
9045 POKEHF,17:POKEHF,9
9046 FORT=1T030:NEXTT
9047 POKEHF,2:POKEHF,2:POKEHF,33
9048 NEXTZ
9049 GOSUB 6000
9050 POKEVO,0
9051 REM-----SPACE NOISE 4**
9052 GOSUB 10000
9053 FORT=1T0200:NEXTT
9054 POKEVO,15:POKEAD,96:POKEHF,21
9055 POKEHF,128:POKEHF,9:POKEHF,9
9056 FORN=0T025000STEP600:GOSUB 11000
9057 FORP=1T060:NEXTP,X
9058 FORN=25000T00STEP-600:GOSUB 11000
9059 FORP=1T060:NEXTP,X
9060 POKEVO,0
9061 RETURN
9062 REM-----
9063 FORN=SSSTOSS+24
9064 POKEAD,0
9065 NEXTX
9066 RETURN
9067 REM-----
9068 POKEHF,INT(X/256)
9069 POKEHF,X-INT(X/256)*256
9070 RETURN
9071 REM-----

```


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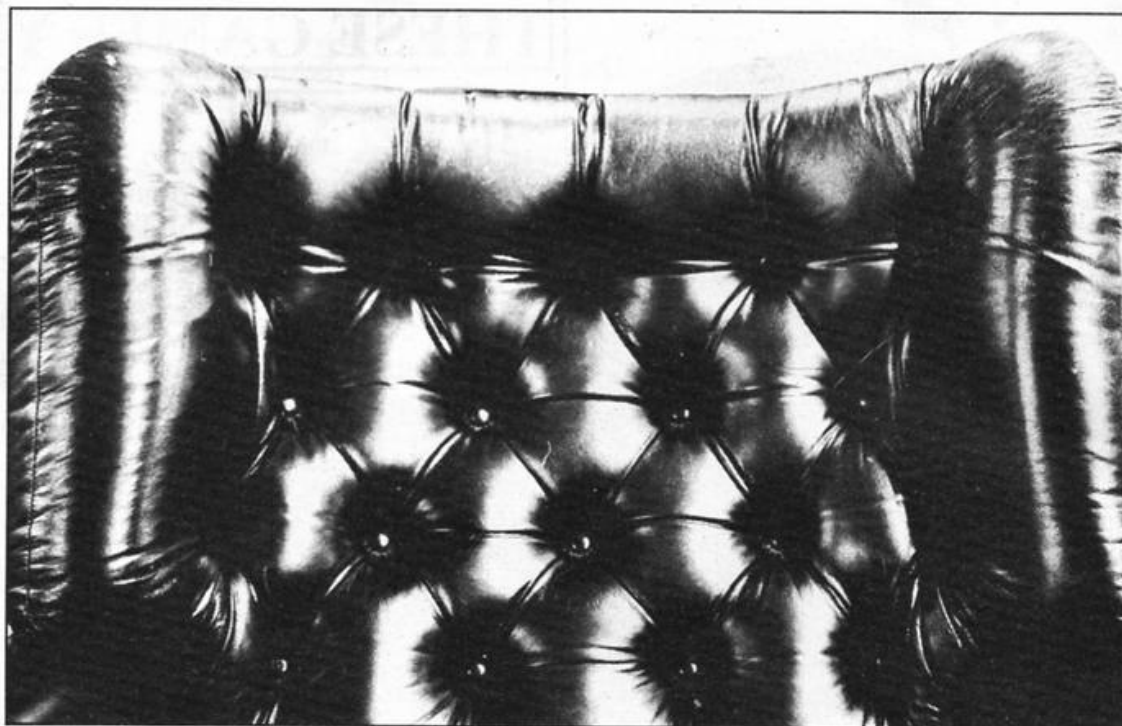


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Remember and could win

Type in Derrick
game for the
you put m
me

Based on the old card game,
this is really a test of memory.

Fifty cards are displayed face
down and the players take turns
to turn over two cards which are
seen by both players.

The aim is to remember
where the cards are in order to
turn over two cards which are
the same.

There are more instructions
in the program.

How it works

50-90 offer instructions, set
arrays
100-120 identify players
130-410 shuffle and deal cards
420-680 main game routine
690-740 instructions
750-830 scoring sub-routine
840-940 end routine
950-970 warns of incorrect key-
press
990-1160 DATA as per REMs



```

40 CLS:PRINT:PRINT"*****PAIRS*****"
50 PRINT:PRINT"IF YOU NEED INSTRUCTIONS PRESS 'ENTER'
ELSE PRESS ANY KEY."
60 A$=INKEY$:IF A$="" THEN 60
70 IF A$=CHR$(13) THEN 680
80 DIM P(11,6),B(11,6),C(11,6),CC(50),TT(50),P$(2),G(2)
90 CLS
100 CLS:PRINT:INPUT"FIRST PLAYER'S NAME";P$(1)
110 PRINT:INPUT"SECOND PLAYER'S NAME";P$(2)
120 REM*****INITIALISE*****
130 S(1)=0:S(2)=0:N=1
140 FOR X=1 TO 6
150 FOR Y=1 TO 11
160 READP(Y,X)
170 NEXT Y,X
180 FOR X=1 TO 6
190 FOR Y=1 TO 11
200 READB(Y,X)
210 NEXT Y,X
220 CLS
230 FOR X=1 TO 6
240 FOR Y=1 TO 11
250 POKE P(Y,X),B(Y,X)
260 NEXT Y,X
270 FOR X=1408 TO 1535
280 POKE X,143
290 NEXT
300 PRINT@384,P$(1)"'S":PRINT@405,P$(2)"'S";
310 PRINT@417,"SCORE"S1:PRINT@438,"SCORE"S2;
320 FOR X=1 TO 50:READCC(X):NEXT
330 SOUND89,2
340 FOR Y=50 TO 1STEP-1:R=RND(Y):TT(Y)=CC(R):CC(R)=CC(Y)
):NEXT
350 SOUND145,2
360 FOR X=2 TO 6
370 FOR Y=2 TO 11
380 C(Y,X)=TT(N):N=N+1
390 NEXT Y,X
400 SOUND178,2
410 REM*****GAME STARTS*****
420 FOR G=1 TO 2
430 PRINT@458,STRING$(11,143):PRINT@458,P$(G)"'S";
440 PRINT@490,STRING$(9,143);:PRINT@490,"FIRST GO";
450 A$=INKEY$:IF A$=""THEN450
460 IF A$<"A" OR A$>"E" THEN GOSUB940:GOTO450
470 A=ASC(A$)-63
480 A$=INKEY$:IF A$="" THEN 480
490 B=VAL(A$):IF B=0 THEN B=10
500 IF A$<"0" OR A$>"9" THEN GOSUB 940:GOTO450
510 IF PEEK(P(B+1,A))=207 THEN GOSUB940:GOTO450
520 POKE P(B+1,A),C(B+1,A)
530 PRINT@490,STRING$(9,143);:PRINT@490,"SECOND GO";
540 A$=INKEY$:IFA$=""THEN 540
550 IF A$<"A" OR A$>"E" THEN GOSUB 940:GOTO540
560 C=ASC(A$)-63
570 A$=INKEY$:IF A$="" THEN570
580 D=VAL(A$):IF D=0 THEN D=10
590 IF A=C AND B=D THEN GOSUB 940:GOTO530
600 IF PEEK(P(D+1,C))=207 THEN GOSUB940:GOTO540
610 POKE P(D+1,C),C(D+1,C)
620 IF C(B+1,A)=C(D+1,C)THEN GOSUB 740:GOTO430
630 FOR X=1 TO 2000:NEXT
640 POKE P(B+1,A),191:POKE P(D+1,C),191
650 SOUND240,1

```


Remember you be a ner

Bateman's card
ragon... but will
ney on your
ory?

Variables

PS locations
B blanks
CC cards
TT cards after shuffling
C card in 5x10 array
G go
P— player
S1, S2 score 1 and 2

```

660 NEXT G
670 GOTO420
680 CLS:PRINT:PRINT" FIFTY CARDS ARE SHOWN,FACE      DOW
N.THE OBJECT OF THE GAME IS  TO PICK MATCHING PAIRS.
690 PRINT" THE PLAYERS TAKE TURNS TO TURN OVER TWO CARD
S BY KEYING IN THE ROW LETTER,FOLLOWED BY THE      COLU
MN NUMBER.THE CARDS ARE      DISPLAYED FOR A SHORT TIME
AND THEN TURNED BACK.
700 PRINT" IF THE PLAYER IS SUCCESSFUL IN CHOOSING A PA
IR,ONE POINT IS      ADDED TO HIS SCORE AND THE CARDSARE
REMOVED FROM THE SCREEN.
710 PRINT:PRINTSTRING$(6,159)"PRESS 'ENTER' TO START"STRI
NG$(6,159);
720 A$=INKEY$:IF A$=""THEN 720
730 IF A$<>CHR$(13) THEN 730 ELSE 80
740 REM*****WIN ROUTINE*****
750 PLAY"T12L404DCDCD"
760 S(G)=S(G)+1
770 IF G=1 THEN PRINT@423,S(G);:GOTO790
780 PRINT@443,S(G);
790 POKEP(B+1,A),207:POKEP(D+1,C),207
800 SOUND240,1
810 IF S(1)+S(2)=25 THEN 840
820 RETURN
830 REM*****END ROUTINE*****
840 PLAY"T5L403GAB04L4..C03G"
850 CLS:IFS(1)>S(2) THEN PRINT@230,P$(1)" WINS" ELSE PR
INT@230,P$(2)" WINS"
860 FOR X=1 TO 1000:NEXT
870 CLS:PRINT@230,"ANOTHER GAME?(Y/N)"
880 A$=INKEY$:IF A$=""THEN880
890 IF A$="Y" THEN RESTORE:GOTO90
900 CLS
910 PRINT@194,"GOODBYE ";P$(1)
920 PRINT@258,"GOODBYE ";P$(2)
930 END
940 REM*****WARNING*****
950 PLAY"T1002CG"
960 RETURN
970 REM*****LOCATIONS*****
980 DATA 1024,1027,1030,1033,1036,1039,1042,1045,1048,1
051,1054
990 DATA 1088,1091,1094,1097,1100,1103,1106,1109,1112,1
115,1118
1000 DATA 1152,1155,1158,1161,1164,1167,1170,1173,1176,
1179,1182
1010 DATA 1216,1219,1222,1225,1228,1231,1234,1237,1240,
1243,1246
1020 DATA 1280,1283,1286,1289,1292,1295,1298,1301,1304,
1307,1310
1030 DATA1344,1347,1350,1353,1356,1359,1362,1365,1368,1
371,1374
1040 REM*****BLANKS*****:
1050 DATA 207,49,50,51,52,53,54,55,56,57,48
1060 DATA 1,191,191,191,191,191,191,191,191,191,191
1070 DATA 2,191,191,191,191,191,191,191,191,191,191
1080 DATA 3,191,191,191,191,191,191,191,191,191,191
1090 DATA 4,191,191,191,191,191,191,191,191,191,191
1100 DATA 5,191,191,191,191,191,191,191,191,191,191
1110 REM*****CARDS*****
1120 DATA 134,134,150,150,166,166,214,214,230,230
1130 DATA 246,246,137,137,153,153,169,169,138,138
1140 DATA217,217,233,233,249,249,131,131,147,147
1150 DATA 163,163,211,211,227,227,243,243,140,140
1160 DATA 156,156,170,170,220,220,236,236,252,252

```



Texas: the state of the stars

A mixture of five new games for the computer that won't lie down

Pelmanism £3.95

MarKat, 4 Cloreen Park, Belfast BT9 5BX

An entertaining game for adults and children alike which relies on players being able to remember a set of 32 cards displayed face-down.

Player one starts by selecting one of the cards by pressing A to Z and 0 to 9. The chosen card is then displayed face-up and the player makes another choice. If the two cards match, they are turned over and play passes to the opponent.

Obviously, play becomes easier as play progresses, because the identity of each card is revealed and there are less to remember.

The pictures used on the cards are four characters in size and include houses, trees, flowers, faces and patterns.

Unfortunately, this is for two players only. An option to have four or five competing would be nice, as would an option to compete against the computer. This would obviously have to rely on a rather unsatisfactory random method, determining whether or not the computer memorised the cards correctly.

J.J.

instructions	75%
playability	70%
graphics	70%
value for money	70%



Hangmog £3.20

SoftI, 14 Station Rd, Brough, North Humberside

A clever and original idea based on Hangman. The prisoner on the gallows is replaced with a rather unfortunate cat which has strayed into the meat works and is caught on a conveyor belt leading to a mincer.

Your job is to guess a word and save moggy.

The alphabet is displayed at the top with a conveyor belt underneath, onto which the letters fall once chosen.

Depending on whether or not the letter chosen is correct, it fails either down the "best beef" chute or lands on the conveyor belt on which moggy is seated.

When a wrong letter falls onto moggy's conveyor belt it pushes a chunk of meat off the other end and into the mincer. As cats have nine lives, moggy has eight and on the ninth incorrect guess he runs out of luck and falls down the mincing chute.

Unfortunately, it is possible to press the same letter any number of times, although, if the player is careless enough to press the same letter twice, he deserves to lose a life.

Overall, well-thought and enjoyable.

J.J.

instructions	70%
playability	80%
graphics	95%
value for money	85%



ASW Tactics 2 £11

DEJ, from Stainless, 10 Alstone Rd, Stockport, Cheshire

After first reading the instructions, full of high powered jargon, I was filled with enthusiasm. However, apart from some original graphic effects and sounds, it fell far short of my expectations.

A U.S. naval officer wrote this and it is a simulation based on his experience as a helicopter pilot.

The screen shows an aerial view of a task force, led by a carrier for the helicopter. You, the 'copter pilot, must safeguard the fleet while searching for an enemy submarine.

To gain information on the

sub's location, the helicopter flies around dropping sonar buoys, using onboard sonar and, if requested, looking for a signal from the surveillance S-3 jet.

Providing a further clue you may request a three-second periscope view of the task force, as seen from the enemy submarine. I failed to believe the accuracy of this when, only having two ships left in the fleet, the periscope still showed three!

After destroying the sub you are greeted by the Stars and Stripes — actually the Squares and Stripes — and a mini fireworks display. Needs Extended BASIC.

100%
35%
60%
45%

instructions
playability
graphics
value for money



Pilot £5.95

Apex, 115 Crescent Drive South, Brighton

A good well-written flight simulator. Screen display is clear and the colours are well contrasted. The display of the terrain map is blocky, but the runway display is good, shown from above as your plane slowly approaches.

The tape loaded first time to give the option of take off, landing or in flight. You are then asked if you require wind effects and the game starts.

In play the program is slow, but gives a reassuring beep when you press any key. There is an audible stall warning, otherwise all is quiet. The instructions

come in a four-page booklet as well as a separate sheet giving loading instructions. The instructions are easy to understand and are clearly set out, like the whole program. The program is easy to use, the slowness being to the players advantage.

Overall, fun and very addictive at the start. Later on, however, the program did become a bit boring, after I had mastered landing. Everything is taken into consideration, such as wind, lift and flap drag.

M.H.

instructions
playability
graphics
value for money

100%
85%
80%
95%



Go for the gold £7

DEJ, from Stainless, 10 Alstone Rd, Stockport, Cheshire

If you've ever fancied searching for the little people's pot of gold then there's plenty here. They're also so easy to obtain that you'll be bored stiff collecting them.

The idea is that you are lost in various forests looking for the gold. The screen shows trees, your man and a pot of gold. Also in the forest are pixies, to help increase your speed, but in pursuit of your man there's a leprechaun. When he catches you a man is lost. The game continues for as long as you have men. With each pot collected its

value increases and you move onto the next forest.

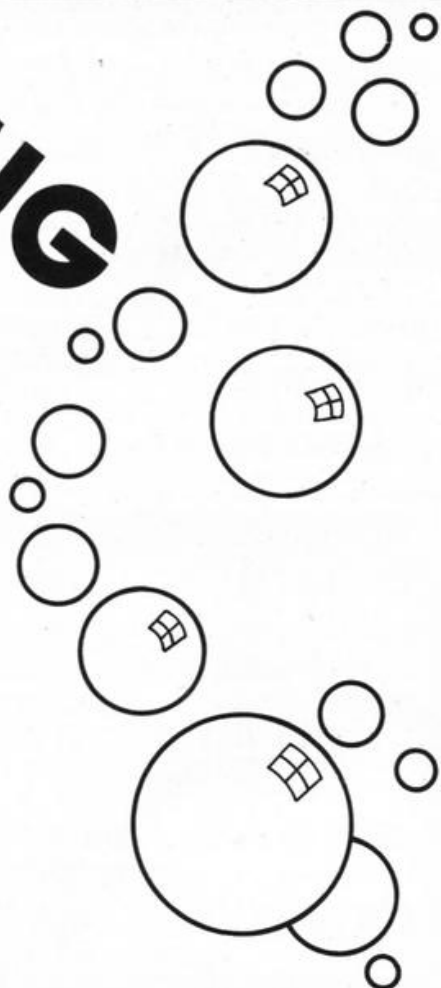
Designed for keyboard or joystick, in the keyboard version it seems a gremlin has joined forces with the little people! by pressing any key other than the arrow keys used in the game your man travels around and off the screen at top speed. With this method of cheating, pots of gold become yours for the taking. At least this provides some amusement in what is otherwise a slow and tedious game. Needs Extended BASIC.

J.W.

50%
20%
40%
25%



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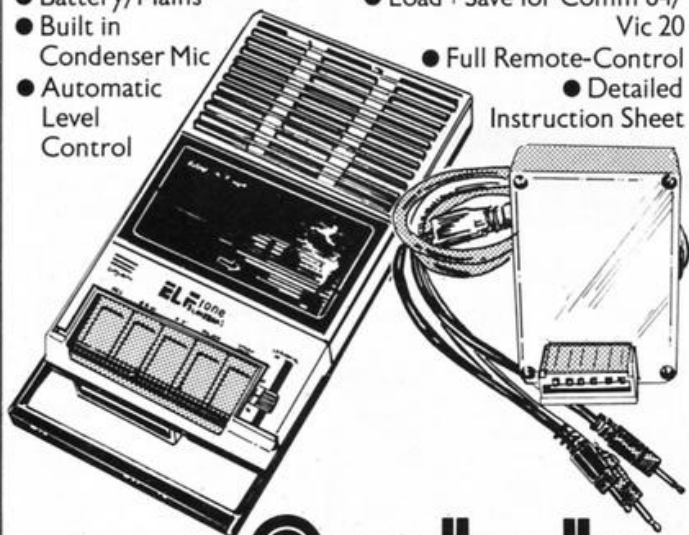
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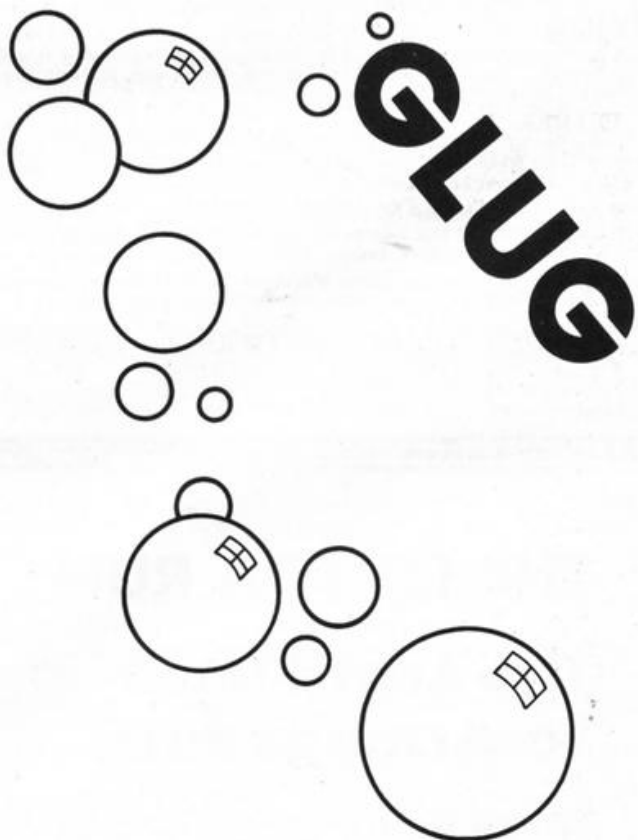
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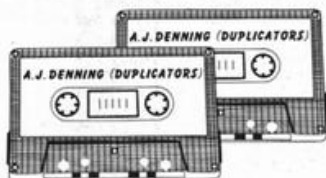
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U.S. SCENE

Wear your computer screen on your wrist

When you see someone glancing at his wrist in future, don't assume he is checking the time. He could be looking at his computer's screen.

Seiko Instruments, parent company of Epson, has just announced a computer read-out. And it has also launched a pocket computer meant for use with the watch. The computer communicates with the display via low-frequency electromagnetic waves.

At present you have to be in Japan to buy one, but it should not be long before Seiko sends them here.

The display can present up to four lines of 10 characters each and two computers are available. Details are available on one: it uses a processor similar to the Z80 and has 26K of ROM and 4K of RAM, 71 keys and interface potential to other displays and printers.

Not surprisingly, Commodore is expected to hold its position at the top of the league table of home computer makers. Last year it has 37 per cent of market — shipping well over a million computers — and this year's prediction is for 36 per cent.

Atari was second with 16 per cent, expected to improve to 20 per cent this year. Texas, which has now pulled out of the market, was next with 14 per cent.

Then there was Timex (nine per cent) which has stopped selling micros after a lack of success with U.S. versions of the Spectrum and ZX81. Tandy was fifth with eight per cent (prediction: 13 per cent) and then there was everyone else.

Next year Coleco, if it is lucky, will command a whopping six per cent. How's that for some educated guessing? We'll see.

Even though the number of computer retailers doubled last year — and the market this year is expected to rise to \$3.6 billion from £2.4 billion — one of America's largest retailers got out of the business.

J C Penney, which had been selling Atari, Coleco and TI, claimed inadequate profits!

The IBM PCjr. is not going to be a significant factor in the home computer market place since most of them sell for well over \$1,000 and home computers are defined here as costing less than \$1,000.

Atari and Activision have joined together to transmit video game and home computer software over the commercial radio waves.

To take advantage of the system, a user would have to connect a special receiver to the video game machine or computer. The bill would come later.

Not wanting to be left out, Control Video, of Virginia, is doing the same thing but via phone lines and modems. Coleco and American Telephone and Telegraph have also announced a similar system using the phone lines.

Playcable, a cable TV company, has been offering games for the Intellivision system for about three years now. Unfortunately, it is about to be left high and dry as Mattel is likely to pull out of the video game business at any time.

That's all for this time. See you next week.

Bud Izen
Fairfield, California

SOFTWARE REVIEWS

Make your micro work for you

These could make more use of your computer. Read what our reviewers think of them

Crystal 32K BBC £3.45

Scientific, Old Loom House, Back Church La, London E1 1LS

It's not often you find BBC software at £3.45 so I wasn't sure what to expect. The wrapping is a bit plain, with few instructions.

Crystal is not a game! It is designed to foretell the future in the style of Nostradamus. The author describes it as radically different. I agree.

One is first confronted with another set of instructions. This still did not create a full image of the program in my mind. I was invited to press any key and unknowingly I conformed. It definitely was original. Line after line of morbid prophecies passed

before me. These are organised into 10 decades with 10 prophecies for each year in the form of four-liners, or quatrains.

The mode 7 display contains no graphics and sound is non-existent. The predictions, which to the unaccustomed eye might seem fairly useless, may in fact hold a great and deep philosophical meaning to those of us who can understand the complex forms of Nostradamus.

The meanings are often beyond me. However, if you wish to gaze into the crystal ball you should know it is only available by mail.

instructions	40%
ease of use	90%
display	20%
value for money	70%



Broadway Boogie and Classics 32K BBC £4.95

Broadway Electronics, 1 The Broadway, Bedford

The cassette box is boring and there are no instructions. But, don't go away — it's not all bad. In fact, this is an interesting little package: three pieces of music, all written in BASIC.

We start with The Broadway Boogie. It's got drums, bass, piano and a trumpet. It really uses the BBC's sound capabilities. All is well until we reach the finale. For a moment or two the piano is out of time. I said there were no instructions. In fact it tells you to type CHAIN "The name of the song". However this is useless

because they are written in the wrong order. CHAIN"" is the best idea.

Next is the G-string, which includes graphics. It needs them. It's very repetitive and sounds just like the Castella advert. I think that's why a smoking cigarette is shown. In this program you can choose the key. Prelude is more classical. A nice piano piece, it is far more interesting.

At £4.95 the cassette is fairly expensive but I feel it is worth it for the change from space games.

instructions	10%
ease of use	80%
display	50%
value for money	80%



My Secret File 48K Spectrum £9.95

Mosaic, from John Wiley & Sons, Baffins Lane, Chichester, Sussex PO19 1UD

This started as a Puffin paperback, and is best described as a diary for lazy or unimaginative youngsters up to 10. At that, I may be maligning 10-year-olds.

Example pages: MY CLOTHES. Sub-headings: Favourite outfit for lounging around... three things I most hate wearing... clothes I'd really like would be... MUM AS I SEE HER: looks her best when... nags me most about... can get round her by... PARTY RATINGS: whose party... what kind... rating...

The author details all possible events and conditions, reducing your whole life to a series of ticks, crosses and the occasional word or underline. Some might give parents unease: "The greatest number of one inch or more shreds, after unpicking a Shredded Wheat".

The computer version loses the cartoons, non-humorous, of the book but allows SAVEing as a datafile, useable yearly, and your very own secret access code. Pages are accessed by content menu and you type one-word answers to "People gasp with shock when they see my..." The mind reels!

instructions	85%
ease of use	75%
display	50%
value for money	40%



Optimon 32K BBC £6.95

Optima, 36 St Petersgate, Stockport SK1 1HL

A machine code monitor program for the cassette-based BBC, this certainly has features which make it a true monitor.

There are block move and copy routines, string or hex searches and logical operations on hex or binary numbers, including subtraction and addition — a flexible range of operations which the monitor can help with and can make very simple indeed.

There is one major drawback: it resides in the upper reaches of user memory (&6700 to &7C00). Try to execute a routine which changes the screen mode and the monitor will be over-written and gone. So you really do need to

instructions	100%
ease of use	75%
graphics	N/A
value for money	80%



First Aid 48K Spectrum £4.60

Eastmead Computer Systems, Eastmead House, Lyon Way, Camberley, Surrey.

Sadly, this is a program in search of a purpose. It purports to be a source of advice when first aid is needed, not a "learn about first aid" program. But by the time the program has loaded, your patient could be dead!

Eastmead has indulged in an orgy of SCREENs to be loaded, with logo, series logo, and finally program name. This takes 3f minutes! And you haven't loaded the program yet. When you have, there's an index then four blocks of code on different parts of the cassette. When you eventually reach what you want,

there is little in the way of practical help. It merely helps you decide whether to call a doctor.

As a program, therefore, it's poor. More seriously, it starts with a disclaimer for errors and omissions, telling you not to proceed unless you accept it. This is not, however, on the inlay card. So you could have a program which you can't accept, but which you've paid for. It ought to be rectified. But frankly I wouldn't recommend you to buy this.

instructions	65%
ease of use	20%
display	50%
value for money	0%



SOFTWARE REVIEWS

The Night Sky 32K BBC £9.90

Bridge Software, 36 Fernwood, Marple Bridge, Stockport SK6 5BE

This is meant for those who have a previous interest in astronomy and for those who might be interested if they knew more. The core is a display which can show the stars visible anywhere on earth on any day between 1975 and 2000, at any time and looking in any particular direction. The display is very easy on the eye despite being in only two colours. The brightness of each star is represented by four sizes of dots and you are able to select each constellation using its International Astronomical Union abbreviation.

The facilities you are given to

control the display allow you to use this program for learning too. The manual, simple but comprehensive, suggests you choose the ANY option which means it will search its memory for a visible constellation and display it for you to learn or guess.

One of the greatest uses for those already knowledgeable in the area will be to pretend they are in a different location and then sample its stellar offerings. The only criticism I have is that when you set up a data it can't tell you if it's cloudy! **D.C.**

instructions	90%
ease of use	95%
graphics	90%
value for money	90%



Maths Orbiter 32K BBC £6.90

Elm Computers, 59 Bateman Rd, East Leake, Loughborough LE12 6NN

The only way to describe this is as an arithmetic text book with pictures, sound and automatic marking. That is really all there is to say. If you feel your child needs practice in one or all of the four rules of number then this may be for you! I think maths has much more to offer than this and that programs like this can do much more harm than good.

The purpose of your answers is to countdown, launch, orbit and land your spacecraft. The graphics are fair but not remarkable. The on-screen prompts are all in capitals which makes them

difficult for younger children despite the good use of double height characters in parts. If you are unfortunate enough to get a problem wrong the correct answer is flashed on the screen for far too short a time. This means it is difficult to learn from mistakes. The levels are difficult to control, you cannot specify maximum numbers, simply an arbitrary level number, and there is no facility for negative or decimal numbers. A very disappointing program of very limited use. **D.C.**

instructions	30%
ease of use	45%
graphics	60%
value for money	30%



Address Manager — Plus 80 48K Spectrum £19.95

OCP, PO Box 99, Oxford

A very rapid machine code program for storing up to 400 full names, addresses, post codes and phone numbers, and retrieving them to order. OCP has 42 characters per line onto the screen instead of 32, and entries and alterations are made by moving the cursor to the required point, then typing. Your input appears in the right place, instead of the bottom two lines.

Though not set up for Microdrives, the program can load and save files of data to

order from the menu. An additional, and very useful feature, is that each name can have up to three identifying codes attached and the address list sorted by these attributes.

The output is where the Plus 80 comes in. This will drive a Centronics printer through the Kempston interface to produce full 80 columns and thus double width, double height and alternative type faces, onto plain paper, labels and so on. It won't, however, drive the ZX Printer, you need the £9.95 version for that. **D.M.**

instructions	90%
ease of use	95%
display	100%
value for money	70%



Software to use and to learn

A mixed bag of utilities and educational programs examined by our experts

Animated Alphabet Dragon 32 £4.95

Dungeon Software, Milton House, St John St, Ashbourne, Derbys

Designed for the early reader, this is a graphical introduction to the alphabet. One is first given the choice of watching the whole display or pressing a key for each picture. Each letter is shown in capital form with an example word beginning with that letter and a picture corresponding to the word, all in high resolution graphics. Each display either has a musical piece of some action. Particularly good ones were hammer, drum, queen and zip. Graphics are clear and

interesting, sound well-used and overall a well-written program. But there are some detractors. This program helps to reinforce letter recognition but is it really versatile enough to be of value? There are no options or changes in action as the alphabet is run through. A collection of words displayed graphically allowing some form of interaction after the alphabet may have been a good idea perhaps. But the program certainly needs some additional stimulus to make it more worthwhile in the long term. **C.G.**

instructions	50%
ease of use	70%
graphics	90%
value for money	60%



Keydefine 48K Spectrum £4.95

Scientific Software, 37 Cottesmore Rd, Hesse, North Humberside

A very impressive tool kit for those who write programs. It's complete with printed instructions covering three sides of A4, and menus for the main program, Microdrive routine and the mini-keydefine enclosed in polythene wallet.

It autoruns to show basic instructions leading to the menu, followed by memory allocation of the routines and a menu of options. Twenty three keys are said to be pre-defined with 12 keys available for redefining — but there appears to be 16 pre-defined for programmers and

eight for use. Holding down the space bar, pressing required key and releasing both produces the routine as a direct command which can be edited or executed with the enter key.

Some of the most valuable are: A turn Auto line number on/off; L line number trace on/off; R renumber BASIC program; K hex to decimal conversion; I decimal to hex; H crosshatch screen. A block delete routine is missing, but a key can be redefined and added to the menu. **T.W.**

instructions	75%
ease of use	70%
display	N/A
value for money	60%



**Remember Andrew Gardner's
three programs in HCW 54?
Here's two more from him to
test your driving skill and your
knowledge of words**

ORIC P

Oric Rally

Keep your car on the road for as long as possible — it's not as easy as you might think.

At the start you choose a skill level which controls how much the road twists. On the higher levels you're allowed to stray onto the grass verge to give you more of a chance!

You are given a 3D view of the road and further ahead there is a blanket of fog. You'll also be given a random day or night scene.

Hint: As in real life, moving the car left seems to move the road right.

How it works

30 selects low-resolution graphics, switches off key-click/cursor

40-90 the whole game is a series of sub-routines

1000-1280 set up the large number of user-defined graphics

2000-2050 select skill level

2060-2200 set up main variables

3000-3310 PLOT fog area, road and driver's cockpit, PLOT all screen colours

4020-4090 make random and automatic adjustments to road

4100-4125 read keyboard, check for crash

4140-4420 check road is still within screen limits

4510-4550 change position of road according to keypress

5000-5120 crash, PRINT score, wait for key

Variables

TR(W) array holding position of each part of the road
AS-ES hold road segments to be PLOTTed
FS holds background to road
PS(W) holds fog graphics
K/M move road on key-press/random movements
P/KS keyboard values
SL skill level
S% current score
H% high score

Hints on conversion

CHRS statements can be removed
CLS clears the screen
PAPER/INK set background/foreground colours
PLOT x,y is equivalent to **PRINT AT**. Places string given at position x (0-38), y (0-26). PLOTTing a number acts as a colour attribute.
WAIT n creates a pause for n milliseconds
SPC can be replaced by **TAB** or removed
PEEK (520)/KEYS reads the keyboard
EXPLODE, PING are sound commands and can be removed or replaced

Wordman

This game will pick a word from a list of 290 and you must guess it before running out of lives.

At the start the number of letters is indicated by full stops. You can enter a single letter or a whole word.

If the letter is correct it will be placed in its correct position/s in the line of full stops.

If wrong, it will be added to a list to remind you what you have already entered. The game will finish if you have made 10 incorrect guesses.

How it works

60-100 set up variables
500-570 choose word, set up guess string variables with appropriate number of full stops
1000-1130 PRINT screen, wait for next guess
2000-2090 check if word has been guessed, update variables controlling screen set up, check if all lives are lost
3000-3050 check if letter guessed is in word, if it is add it to guess string
4000-4090 failure routine
5000-4090 word guessed routine
6000-6580 DATA for 290 words

Variables

GS guess string to show progress
G1S remaining lives
L1S guessed letters
WS word to be guessed
IS your guess
GI%, LI%, G% used in SPC command when PRINTing the screen
W% length of word to be guessed

Hints on conversion

POKE 618,10 and the screen **POKEs** can be removed
PLAY is a sound command and can be replaced or removed
When converting to other computers, the word guessed routine would have to be replaced by a display of your own design.
● See also Hints on conversion for Oric Rally

If the word you enter is correct or if you have completed the word by entering the last letter you will be congratulated and game will re-start.

The screen will also display your remaining lives.

Listing 1 — Oric Rally

```
10 REM ** ORIC-RALLY **
20 REM BY A.P.GARDNER
30 LORES0:PRINTCHR$(17)CHR$(6)
40 GOSUB1000 'UDG
50 GOSUB2000 'VARIABLES
60 GOSUB3000 'SCREEN
70 GOSUB4000 'MAIN GAME
80 GOSUB5000 'END
90 GOT050
990 REM USER DEFINED GRAPHICS
1000 FORP=(46080+(97*8))TO(46080+(123*8)+7)
1010 READU:POKEP,U:NEXTP:RETURN
1020 DATA1,2,2,4,8,16,16,32
1030 DATA32,16,16,8,4,2,2,1
1040 DATA63,0,0,0,0,3,30,41
1050 DATA63,0,0,15,16,32,0,32
1060 DATA63,0,0,63,0,0,0,0
1070 DATA63,0,0,60,2,1,0,1
1080 DATA63,0,0,0,0,48,30,37
1090 DATA54,2,36,60,56,48,48,32
1100 DATA27,16,9,15,7,3,3,1
1110 DATA1,2,3,3,7,15,15,31
1120 DATA32,16,48,48,56,60,60,62
```

**Keep your min
the road... an
guess the wo**


```

3070 NEXTN
3080 PLOT15,15,A$
3090 PLOT14,16,B$
3100 PLOT13,17,C$
3110 PLOT12,18,D$
3120 PLOT11,19,E$
3130 PLOT2,20,"tttttttttt lmmmm tttttt
tttt"
3140 PLOT2,21,"t      t  grpo oasy t
t"
3150 PLOT2,22,"t      t  ttwcdfgxtt t
t"
3160 PLOT2,23,"tttttttttt rtujhbaikvts tttttt
tttt"
3170 N=INT(RND(1)*2)
3180 IFN=0THENP=0:I=6:C=1
3190 IFN=1THENP=6:I=7:C=5
3200 R=2:CB=16
3210 PAPERP:INKI
3220 FORN=15TO19
3230 PLOT0,N,R
3240 NEXTN
3250 FORN=20TO23
3260 PLOT0,N,CB:PLOT1,N,C:PLOT38,N,(P+16)
3265 NEXTN
3270 PLOT4,21,"SCORE"
3280 PLOT27,21,"HI-SCORE"
3290 PLOT10,22,C
3300 PLOT34,22,C
3310 RETURN
4000 REM * MAIN GAME *
4020 K=0:M=0
4030 TR(2)=TR(1)-1
4040 TR(3)=TR(2)-1
4050 TR(4)=TR(3)-1
4060 TR(5)=TR(4)-1
4070 R=RND(1)
4080 IFR>.5THENM=SL:GOTO4090
4085 M=-SL
4090 GOSUB4400
4100 P=PEEK(520)
4110 K=(P=188)-(P=172)
4120 GOSUB4500
4125 IFR(5)<<(8-SL)ORTR(5)>>(14+SL)THENRETURN

4140 FORN=15TO19
4150 PLOT1,N,F$
4160 NEXTN
4170 PLOTTR(1),15,A$
4180 PLOTTR(2),16,B$
4190 PLOTTR(3),17,C$
4200 PLOTTR(4),18,D$
4210 PLOTTR(5),19,E$
4230 S%=S%+1
4240 IFS%>H%THENH%=S%
4250 PLOT3,22,STR$(S%)
4260 PLOT27,22,STR$(H%)
4270 GOTO4020
4400 REM CHECK THAT ROAD NOT OFF SCRIN
4410 IF(TR(1)+M)>5AND(TR(1)+M)<21THENTR(1)=TR
(1)+M
4420 RETURN
4500 REM CHANGE POS OF TRACK BY YOU
4510 K=K*SL
4520 FORN=1TO5
4530 TR(N)=TR(N)+K
4540 NEXTN
4550 RETURN

```

```

4990 REM YOU HAVE CRASHED
5000 PAPER7
5010 WAIT40
5020 PAPER1
5030 EXPLODE
5040 WAIT150
5050 CLS:INK0
5060 PRINT:PRINT:PRINTSPC(4)"YOU'RE CAR'S A R
IGHT-OFF!"
5070 PRINT:PRINT:PRINTSPC(4)"YOU MANAGED TO S
CORE ";S%
5080 PRINT:PRINTSPC(5)"THE HIGH SCORE IS ";H%

5090 PRINT:PRINT:PRINTSPC(4)"PRESS A KEY TO P
LAY AGAIN"
5100 K$=KEY$
5110 K$=KEY$:IFK$<>" "THENRETURN
5120 GOTO5110

```

Listing 2 — Wordman

```

10 REM      WORDMAN

20 REM      BY A.P.GARDNER

30 REM
40 REM SET VARIABLES/COLOURS
50 REM
60 PAPER7:INK0:CLS
70 POKE618,10
80 G$="":G1$="*****":G2%=10
90 G1%=17-(INT(LEN(G1$)/2))
100 L1%=17-(INT(LEN(L1$)/2))
110 REM
120 REM CHOOSE WORD
130 REM
140 FORN=1TO(INT(RND(1)*290)+1)
150 READW$
160 NEXTN
170 W%=LEN(W$)
180 FORN=1TOW%
190 G$=G$+","
200 NEXTN
210 G%=17-(INT(LEN(G$)/2))
220 REM
230 REM SET UP SCREEN
240 REM
250 CLS
260 INK7
270 PRINT:PRINTSPC(13)"WORDMAN"
280 PRINT:PRINT:PRINT:PRINT
290 PRINTSPC(12)"LIVES LEFT"
300 PRINT:PRINTSPC(G1%);G1$
310 PRINT:PRINT:PRINT:PRINT
320 PRINT"LENGTH OF THE WORD/CORRECT LETTERS
"
330 PRINT:PRINTSPC(G%);G$
340 PRINT:PRINT:PRINT:PRINT
350 PRINTSPC(6)"LETTERS YOU'VE GUESSED"
360 PRINT:PRINTSPC(L1%);L1$
370 INK0
380 PRINT:INPUT"ENTER GUESS:PRESS [RETURN]";
I$
390 REM
400 REM CHECK IF LETTER IS GUESSED

```



```

1990 REM
2000 IF LEN(I$) <> 1 THEN 2020
2010 GOSUB 3000
2020 IF G$ = W$ THEN 5000
2025 IF I$ = W$ THEN 5000
2030 IF LEN(I$) = 1 THEN L1$ = L1$ + I$
2040 G1% = 17 - (INT(LEN(G1$)/2))
2050 G2% = 17 - (INT(LEN(G2$)/2))
2060 L1% = 17 - (INT(LEN(L1$)/2))
2070 IF F = 0 THEN G2% = G2% - 1: G1$ = LEFT$(G1$, G2%)

2080 IF G1$ = "" THEN 4000
2090 GOTO 1000
2970 REM
2980 REM CHECK IF LETTER IN WORD
2990 REM
3000 F = 0: FOR N = 1 TO W%
3010 L$ = LEFT$(G$, (N-1)): R$ = RIGHT$(G$, (W%-N))
)
3020 M$ = MID$(W$, N, 1)
3030 IF I$ = M$ THEN G$ = L$ + M$ + R$: F = 1
3040 NEXT N
3050 RETURN
3970 REM
3980 REM YOU COULD NOT GUESS IT
3990 REM
4000 PAPER0: INK7: CLS
4010 PRINT: PRINT: PRINT: PRINT: PRINT: PRINT: PRINT: PRINT
T: PRINT
4020 PRINT: PRINT SP(12) "HARD LUCK!"
4030 PRINT: PRINT SP(7) "THE WORD IS "; W$
4040 FORM = 1 TO 3
4050 PLAY0, 1, 1, 100: WAIT 50
4060 PLAY0, 1, 1, 100: WAIT 150
4070 NEXT M
4080 WAIT 100
4090 RUN
4970 REM
4980 REM YOU GUESSED IT
4990 REM
5000 CLS: INK7
5010 FOR N = 4000 TO 49100 STEP 20
5020 POKEN, INT(RND(1)*6)+16
5030 PLAY0, 1, 0, 10
5040 NEXT N
5050 PLOT 12, 13, "YOU GOT IT!"
5060 WAIT 500
5070 RUN
5970 REM
5980 REM DATA BANKS
5990 REM
6000 DATA ABBREVIATE, ACCELERATE, ACROBAT, ADVENTURE
6010 DATA AGENDA, ALARM, ALTERNATE, AMPLIFY
6020 DATA ANIMAL, ANTIDOTE, APPEASE, ARCHITECT
6030 DATA ARROGANCE, ASS, ATLAS, AUDIT, AXE
6040 DATA BABOON, BAMBOOZLE, BARNACLE, BATHOS, BEAUTY
6050 DATA BEGUILE, BENELUX, BICENTENARY, BISCUIT
6060 DATA BLEMISH, BLUE, BOND, BOUNCE, BRAIN
6070 DATA BRIDGE, BRUSH, BULK, BURN, CADET
6080 DATA CAMERA, CAP, CARNAGE, CATACOMBS, CELL
6090 DATA CEREAL, CHAPEL, CHEESE, CHOP, CIRCLE
6100 DATA CLAP, CLOCK, COCCYX, COLLECT, COME
6110 DATA COMMODORE, CON, CONFUSE, CONSTRUCT
6120 DATA CONVENIENT, CORN, COASTAL, COWARD, CRAZE

```

```

6130 DATA CRISIS, CRY, CURE, DAGGER, DASTARDLY
6140 DATA DECLINE, DEGREE, DEMONSTRATE, DENIM
6150 DATA DESCEND, DUECE, DIAPHRAGM, DILUTE
6160 DATA DISADVANTAGE, DISGUST, DISSIPATE, DIVERGE
6170 DATA DOLE, DOZE, DRINK, DULCET, EARTH
6180 DATA EFFLUENT, ELECTROCUTE, EMBRACE, ENCHANT, ENJOY
6190 DATA ENTHUSIASM, EPIC, ERASE, ETCH, EVOLVE
6200 DATA EXCLAIM, EXPEDITE, EXTINCT, FAHRENHEIT, FATE
6210 DATA FAVOUR, FERRY, FINAL, FISH, FLASH
6220 DATA FLOOR, FOCUS, FORECLOSE, FOUND, FRESH
6230 DATA FRUSTRATE, FUTURE, GARAGE, GENERATE, GET
6240 DATA GIRDLE, GNOME, GOSPEL, GRAND, GRIND
6250 DATA GROUND, GUST, HALLUCINATE, HARD, HEAD
6260 DATA HECKLE, HERO, HOG, HOOLIGAN, HUMILIATE
6270 DATA HURDLE, ICE, IMMACULATE, IMPOSSIBLE
6280 DATA INCLINE, INDIA, INFER, INITIAL
6290 DATA INSPIRE, INTERFERE, INVENT, IRON, JADE
6300 DATA JET, JUBILANT, KEEL, KINDERGARTEN, KNIFE
6310 DATA LABEL, LANGUAGE, LAUGH, LEAGUE, LETTER
6320 DATA LIFE, LINK, LIZARD, LOOK, LUNGE
6330 DATA MADAM, MAN, MANUFACTURE, MASS, MAY
6340 DATA MELT, METEOR, MILL, MINUTE, MODERATE
6350 DATA MONKEY, MORN, MUFFIN, MUSIC, NASTY
6360 DATA NECK, NEWS, NOISE, NOURISH, OBJECT
6370 DATA OCTAVE, OPEN, ORIC, OVER, PACE, PAN
6380 DATA PARALLEL, PATHOS, PEEP, PERFUME
6390 DATA PET, PHONE, PIG, PITCH, PLEAD, POLE
6400 DATA POMP, POSSESS, PRAISE, PREPARE, PRINT
6410 DATA PROBE, PROOF, PROTOCOL, PULL, PYRAMID
6420 DATA QUAKER, QUILT, RADIO, RANGE, REAR
6430 DATA RECRUIT, REFLEX, RELAX, REPEL, RESIGN
6440 DATA RETREAT, REVOLT, RING, ROLL, ROULETTE, RUN
6450 DATA RUSTLE, SALAD, SANCTION, SATURN, SCAR
6460 DATA SCOOP, SCRIPT, SEAT, SEIZE, SENTENCE, SET
6470 DATA SHADOW, SHEAR, SHOOT, SHRILL, SILK, SIREN
6480 DATA SIT, SLAVE, SLOP, SNEEZE, SOFT, SOUND
6490 DATA SPAN, SPIV, SPUR, STALL, STEM, STOLID
6500 DATA STOP, STRING, SUBLIME, SUGAR, SUPPER
6510 DATA SWAN, SYMPATHY, TAMARIND, TATTOO, TEMPERATE
6520 DATA TENANT, THANK, THIRTEEN, THUS, TINGLE
6530 DATA TOGGLE, TOUGH, TRANSCRIBE, TREAD, TRILL
6540 DATA TROUT, TUG, TWIST, UNATTAINABLE, UNDER
6550 DATA UNEVEN, UNIVERSE, UNSETTLE, URN, VAPOUR, VARY
6560 DATA VERB, VIGIL, VITAMIN, WALK, WASH, WEEP
6570 DATA WHALE, WHOSE, WISH, WORM, XYLOPHONE, YOU
6580 DATA ZERO

```



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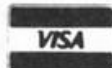
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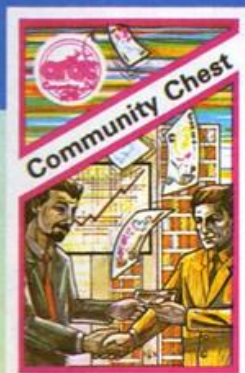
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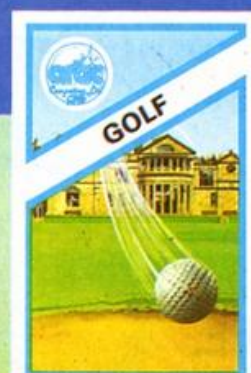
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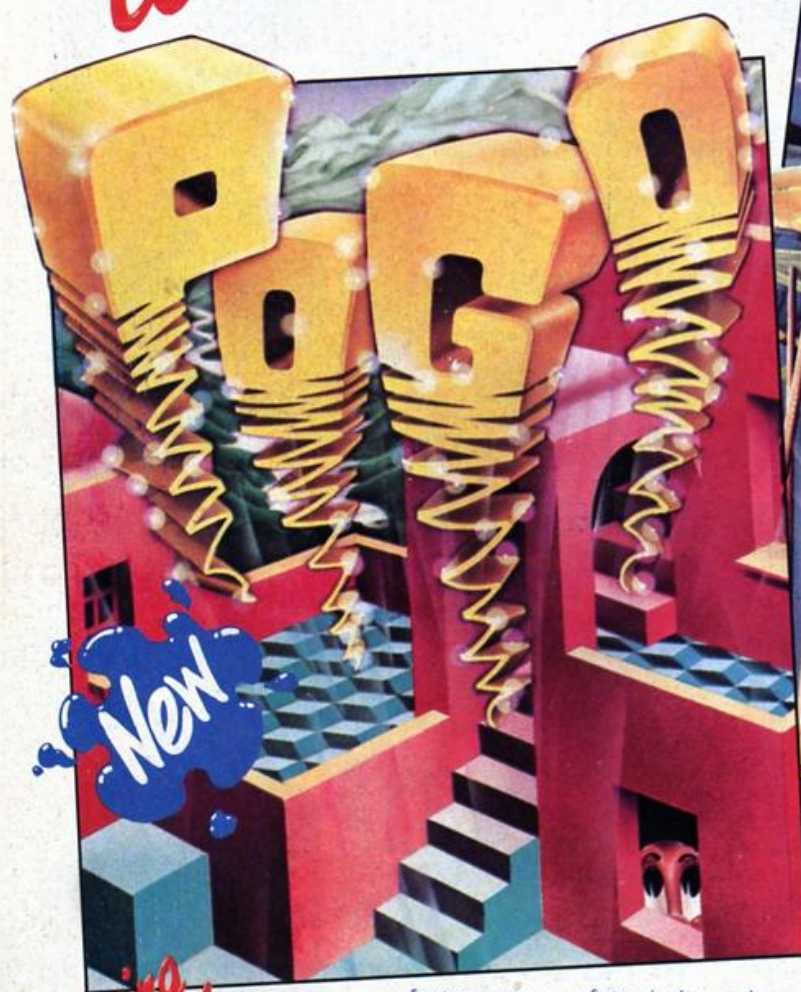
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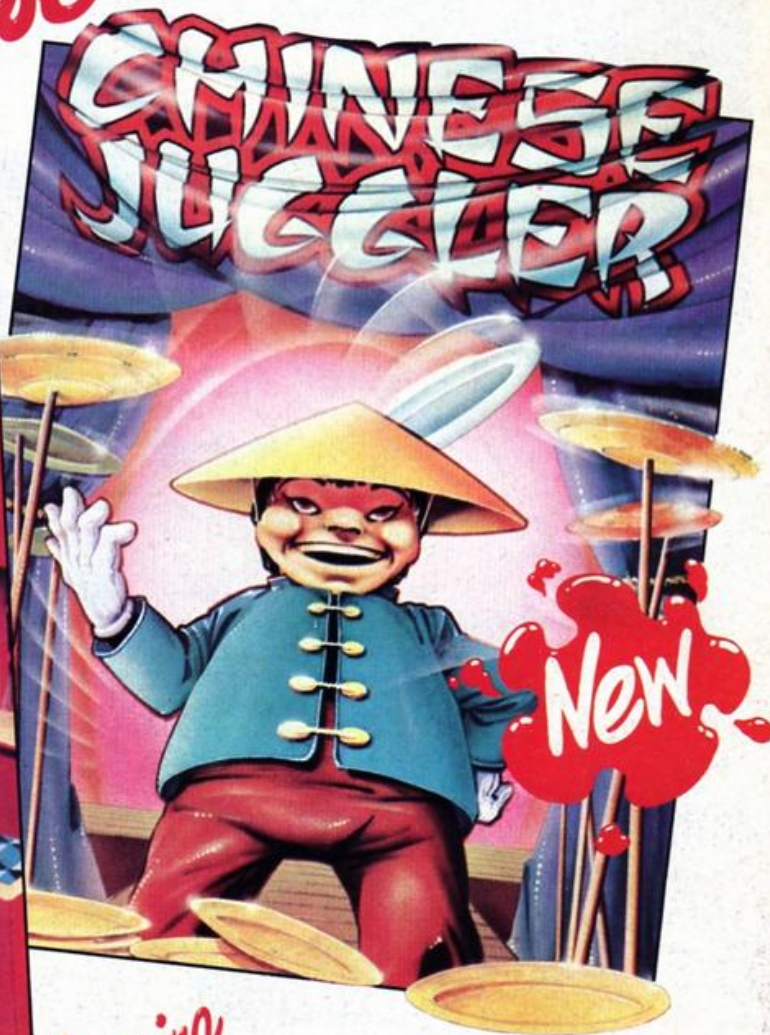


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